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THE UNITED STATES AIR FORCE AND PROFESSION: WHY SIXTY  
PERCENT OF AIR FORCE GENERAL OFFICERS ARE STILL PILOTS WHEN  
PILOTS COMPRISE JUST TWENTY PERCENT OF THE OFFICER CORPS

A Dissertation  
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Graduate School of Arts and Sciences  
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degree of  
Doctor of Philosophy  
in Government

By

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Washington, DC  
August 25, 2006

The views expressed in this dissertation are those of the author and do not necessarily reflect the official policy or position of the United States Air Force, Department of Defense, or the US Government



# **THE UNITED STATES AIR FORCE AND PROFESSION: WHY SIXTY PERCENT OF AIR FORCE GENERAL OFFICERS ARE STILL PILOTS WHEN PILOTS COMPRISE JUST TWENTY PERCENT OF THE OFFICER CORPS**

Brian J. Collins, M.P.A.

Thesis Advisor: Andrew Bennett, Ph.D.

## **ABSTRACT**

The concept of profession explains why approximately 60 percent of Air Force general officers are still pilots when pilots comprise not quite 20 percent of the officer corps. The percentage of Air Force general officers who are pilots declined from 88 percent in FY1948 to 63 percent in FY2003. Over the same period, the percentage of total Air Force officers who are pilots decreased from 50 to 19 percent. This presents a two-sided puzzle. Standard bureaucratic politics theory does not explain why a group with a monopoly on organizational political power (pilots) would relinquish power and why pilots are still overrepresented in the general officer ranks. The answer to the puzzle lies in the Air Force officer corps' self-identification as a profession. That profession develops new fields of expertise in order to maintain its relevancy in the face of the changing character and nature of warfare, and the officer corps' composition changes as its expertise changes. The primary motivations for these changes are the responsibilities inherent in the profession's contract with society. Society awards jurisdiction over a specific competency to one or more professions. The combination of responsibility and jurisdictional competition resulted in pilot general officers making

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## Chapter 1: Introduction

This introductory chapter consists of the following sections: The Puzzle, Competing Explanatory Models, Historical Background, Caveats & Assumptions, Definitions, Methodology, and Manuscript Layout.

### The Puzzle

The percentage of Air Force general officers who are pilots declined from 88% in FY1948, the year of the Air Force's independence from the Army, to 63% in FY2003.<sup>1</sup> Over the same period, the percentage of total Air Force officers who are pilots decreased from 50% in FY1948 to 19% in FY2003. See Chart 1-1 (Comparison of Pilots as a Percentage of General Officers versus as a Percentage of Total Officers). Theory does not explain why a group with a monopoly on organizational political power, i.e., pilots, would relinquish power. The decreases are roughly parallel, and a gap in fact remains. Since pilot general officers presided over the entire process, and the data indicates a leveling out in the percentage of pilots out of the total officers and potential renewed growth in the percentage of pilot general officers by FY2003, there is more involved in the puzzle than the simple issue of why the percentage of pilot general officers started out so high or the percentage of pilots so low. Pilot general officers have consciously lowered the percentage of pilots in both the general officer and the total officer ranks, but there appears to be floor, beyond which they will not go. This

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<sup>1</sup> The term *general officer* (GO) means officers of general rank, i.e., holding the rank of brigadier general (one-star), major general (two-star), lieutenant general (three-star), general (four-star), or general of the Air Force (five-star; during time of war only).

**Chart 1-1: Comparison of Pilots as a Percentage of General Officers Versus  
as a Percentage of Total Officers**

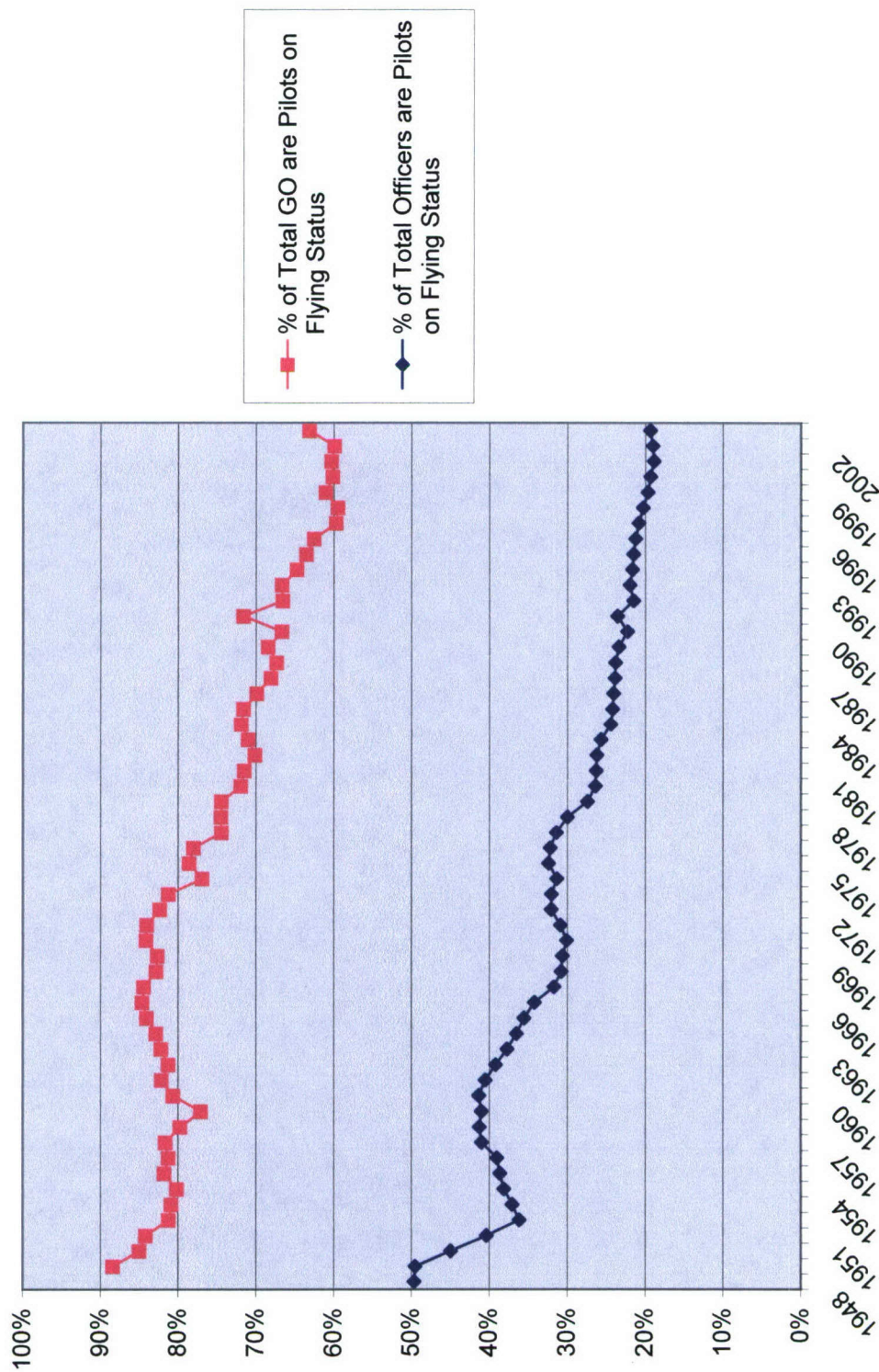


Chart based on data from the USAF Statistical Digest series



manuscript uses the concept of profession to explain why approximately 60% of Air Force general officers are still pilots when pilots comprise not quite 20% of the officer corps.

### Competing Explanatory Models

The puzzle is multi-sided. Assessing whether the curves are a “good” or a predicted trend depends on the viewer’s perspective or model. The public at large generally associates the Air Force with flying. Since pilots are in charge of the aircraft, it seems logical that most generals should be pilots. Consequently, from this perspective the question is why are the percentages of pilots and pilot general officers decreasing? Some might even go a step further and ask what is being done to reverse these “dangerous” trends?<sup>2</sup> From a bureaucratic politics perspective, the question is still one of why the percentages of pilots and pilot general officers are decreasing. However, the reason for the question is different. The interest switches to the process of how a group (pilots) that was obviously the dominant group and possessed a near

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<sup>2</sup> Anecdotally, the public’s general perception is that the USAF is all about flying, and that most, if not all officers are pilots or at least fly in some capacity. Whenever I am asked what I do for a living, I respond that I am an Air Force officer. That invariably leads to one of two further questions: Am I a pilot, or what do I fly? The first question indicates uncertainty as to whether all officers are pilots, or perhaps knowledge that some officers are not pilots. The second question indicates certainty that all officers are pilots; so there is no need for the first question. Furthermore, when I mention the current percentages of pilot generals and pilots at large in the Air Force to Air Force personnel, they invariably express surprise, expecting both to be higher. If I “flip” the statistics around and state that over 80% of the members of the current Air Force officer corps are not pilots, I get an astonished look from airman and civilian alike, and sometimes a comment along the lines that it probably is a good thing that at least 60% of the AF generals are still pilots since airplanes and pilots are what the Air Force is all about; and pilots should obviously be running it. The initial Air Force officer corps did an extraordinarily good job of selling its flying expertise in its quest for a public recognition of its status as a unique profession.

monopoly on political power within the organization lost its position.<sup>3</sup> An organizational culture perspective yields the same question of why the percentages of pilots and pilot general officers are decreasing, but again from a different perspective. The interest switches to the factors that caused the disconnect between the organizational culture, which was so dominated by the pilot in mythos and in practice, and the actual percentages of pilots. Furthermore, what is the effect of the decreasing percentages of pilots on the organizational culture? From a business perspective, however, the basic question changes. If the percentage of total Air Force officers who

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<sup>3</sup> Bureaucratic politics models indicate that once a group has political power in an organization, it will not relinquish this power. The group will fight to keep itself in control, and attempts to change the organization internally will fail unless the change can be shown to be in the controlling group's interest. The group "pilots" self-identify as both a group and as the group in power. "Wings," flight suits, leather jackets, flight pay and pilot bonuses, better promotion rates, real and glass ceilings limiting opportunities for command for non-pilots, and a general cultural emphasis on flying as the bedrock of the Air Force all indicate both a strong group self-identity and a clear pilot-dominated organizational culture as well as the successful implementation of structural features preserving the group and its power within the institution. There are many barriers to entry into the pilot group. Since 1965 one must be an officer. That means that one must be a US citizen, meet not only regular commissioning physical standards but flying standards as well, and normally complete Officer Training School (OTS), Reserve Officers Training Corps (ROTC) or Air Force Academy pre-commissioning training. Entry via the Aviation Cadet Program is discussed in more detail in Chapter 8. In addition, the Air Force has performed additional screening of pilot candidates prior to or during OTS and ROTC. Traditionally, (until 1993) Air Force Academy graduates physically qualified to fly have been given pilot training slots. After successfully completing these hurdles, the officer must successfully complete the approximately one-year long Undergraduate Pilot Training (UPT) to earn pilot wings and status. Although restrictions on female pilots have gradually eased over the last 25 years, USAF pilots are typically white males. Leaving aside the issues of race, gender and ethnicity representation in US colleges in general, the USAF does not appear to overtly discriminate in favor of white males. Anecdotally, prior to 1993 the primary difference between those going to UPT or not from a USAFA class was whether the cadet needed glasses or not. The discrimination on the basis of visual acuity is interesting from the point of view that this is largely an initial barrier to group entry. Once the individual begins pilot training, that officer will remain on flying status even if required to wear glasses or contact lenses later. Culturally, however, wearing glasses has been a sign of embarrassment for many pilots. They only suffered the glasses when they really needed to read or see something, usually with a quip about how bad it is to need glasses, which of course, they quickly took off again as soon as possible. Furthermore, since glasses interfere with wearing night vision goggles, the Air Force has subsidized contact wear and laser surgery for pilots and some navigators while simultaneously barring candidates with contacts or laser surgery from UPT and Undergraduate Navigator Training.



are pilots has already dropped so precipitously because they are no longer needed in such numbers and because the Air Force is moving aggressively into new non-pilot markets, why are there still so many pilot general officers? This might also spin off into the tangential issue of what made the pilot general officers so accepting of new technologies that take the company into new markets that appear to run counter to their own experiences.

Bureaucratic politics models emphasize the distribution of political power within and between organizations. Organizational culture models emphasize an organization's culture, and business models attempt to weed out economic inefficiencies and look at risk management. That is not to say that there are not issues concerning the distribution of power, the impact of organizational culture, and business efficiency within the officer corps. All these perspectives overlap with respect to factors such as organizational mission (what does the organization do, how does it decide what that mission is, and how does it plan and execute that mission?), internal organizational dynamics (who is in the organization, what are the power relationships, and how do interactions occur?), relations with external organizations (competitors, regulators, suppliers, and the market), and feedback and growth mechanisms and relations. In addition, one can subsume organizational culture aspects in each perspective, or remove it for comparative purposes.

The Air Force is indeed a governmental bureaucracy, led by the Secretary of the Air Force, situated within the Department of Defense, under executive control, but

replete with congressional oversight. Consequently, political science and bureaucratic models appear applicable. Although it is not a for-profit business, the Air Force attempts to run itself in an economical manner and be a good steward of the tax dollars allocated to it. However, the Air Force must contort itself in order to fit business models, and the Air Force's adoption of business "Quality" concepts in the late 1980s and early 1990s caused confusion in the Air Force: Is the bombing target a "customer" in some sense and what are the implications of that? What most distinguish the various perspectives are the motivations ascribed to the organization and its activities.

The distinguishing characteristic of the Air Force officer corps is that it identifies itself as a profession. When shifting to concept of profession, the focus shifts away from the "Air Force," the big bureaucratic mixture of civilian, military, active duty and reserve forces under the Secretary of the Air Force's purview, to the relatively small Air Force officer corps. Civilians and enlisted airmen are traditionally excluded since the expertise in the art of war-making and the responsibility for the effects of specific military actions are generally believed to reside in the officer level.<sup>4</sup> The officer corps is the keeper of the expertise and also the largely independent decider of who becomes an officer, who stays, and who is promoted within the officer ranks. Consequently, the officer corps is the focus of this manuscript, as seen through the prism of profession rather than business or bureaucratic politics.

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<sup>4</sup> Although I question the exclusion of enlisted personnel from the profession and it is clear that there is a blurring between some civilian and military positions, for this manuscript I limit my study to the officer corps as the profession to keep the project within manageable bounds.

That profession develops new fields of expertise in order to maintain its relevancy in the face of the changing character and nature of warfare, and the officer corps' composition changes as its expertise changes. The primary motivations for these changes are the responsibilities inherent in the profession's contract with society. Of the perspectives and models listed at the beginning of this section, the general public's perspective comes closest to providing a clue as to how to approach the study of an officer corps. The general public perceives itself to have a stake in the officer corps' composition, and it is more than an abstract or passing interest.<sup>5</sup> Major adjustments in professional expertise require society's acceptance in the form of an award of jurisdiction over a specific competency to one or more professions.

Consequently, the combination of responsibility and jurisdictional competition resulted in pilot general officers making choices that over time have led to an Air Force in which the locus of decision-making is evolving out of the cockpit and into the command and control, communications, computer, intelligence, surveillance and reconnaissance (C4ISR) system. Pilots and flying, once the hallmarks of the Air Force,

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<sup>5</sup> Despite this concrete interest, work on profession tends to fall outside of the major fault lines of academic study. Political scientists and public policy experts tend to concentrate on government and political processes and favor bureaucratic politics models. Studies from this perspective tend to emphasize the military as a bureaucracy engaged in political struggle or look at the effects of organizational culture on political power within military organizations. Business schools tend to ignore the military since the military is heavily regulated and not run for profit. Professions often have their own professional schools (e.g., medical schools, law schools and seminaries), but their emphasis is passing on professional knowledge, not analyzing the profession itself. Consequently, sociologists, some political scientists, and a few practitioners work between the cracks on issues of profession. However, many works deal with definitions of profession, often to justify the consideration of a particular line of work as a *profession*.



are still present, but have become much less important. However, pilots remain overrepresented in the general officer ranks because of the lagged effects of past structural factors that stem largely from strategies that the officer corps' employed in its struggle to establish itself as a new profession, independent of the Army and the other military services. In fact, these enduring structural factors have masked the dramatic changes in the Air Force officer corps' expertise, composition, and jurisdiction. Meanwhile, the Air Force officer corps reassures society that the profession is continuing to meet its obligation to defend the nation in an effective and efficient manner while simultaneously seeking a grant of monopolistic jurisdiction over C4ISR and visionary forms of warfare.<sup>6</sup> C4ISR is important because it is the backbone of all Air Force operations today—nothing can be done without it—and visionary forms of warfare are important because they may replace manned flying operations tomorrow.

On a broader scale, the concept of a profession offers an explanation for why an organization's leadership might implement a strategy that not only opposes a prominent strand of the organization's culture, but over the long haul, portends the demise of that core group. As technology reduces the required workforce and shifts the locus of decision-making authority to higher, more centralized levels, it becomes clear that the old way of doing business is fast coming to a close and that new career paths may be needed for the new decision-makers. This juncture provides a place to view and

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<sup>6</sup> *Visionary warfare* includes aircraft without pilots on board, the use of space and space-based assets, surface-based missiles, computer and information warfare, and the concept of effects-based operations.



analyze competing archetypes within the profession, their roles in defining who makes up the profession and what work the profession does, as well as the impact of the demands of professional jurisdiction and professional social responsibility. Although this study concentrates on the Air Force officer corps, the issues developed have implications for the other military services as well as for occupational groups seeking some degree of recognition as a profession.

The professional perspective is also important because studies of the military based on bureaucratic politics perspectives meet with minimal acceptance by Air Force and military officers. The officer corps does not see itself or its members as bureaucrats engaged in daily struggles to gain a bit more political power or resources here, while defending against Army or Navy encroachments there. Although some higher level Air Force staff jobs certainly deal with Congress, the Department of Defense bureaucracy and contentious issues of inter-service rivalry, the focus of Air Force officership is war—preparing for war, conducting war, and making life and death decisions under battle conditions. The Air Force officer corps is a profession, not a bureaucracy. It is a calling. Officers do not join the Air Force for personal gain or to amass political power, and their tenures in senior leadership positions are too short to enable them to wield any power that they might gain. Instead, many would say that the Air Force officer corps is part of the traditional profession of arms, whose members have taken on the obligation of defending the nation.

That being said, the Air Force officer corps considers itself to be a different and special breed within the military profession. Its culture is that of airmen and airpower, a culture beyond the capacities of mere ordinary earth-bound mortals to understand or to participate in. This dichotomy is not based in a sense of bureaucratic politics, but in a conviction that the Air Force officer corps' visionary sense of its particular expertise is the best way to win wars and defend the nation. The Air Force officer corps has difficulty articulating this point of view because it is trapped to an extent in its conception of the military profession as a single, static, multi-service entity. This manuscript dispenses with that formulation. Instead, it treats the Air Force officer corps as an independent profession. Since the officer corps is the military and professional leadership within the Air Force organization, the focus is on the Air Force officer corps and its internal evolution against the backdrop of the dynamic competition between professions, i.e., between the officer corps of the various military services and not the services themselves.

#### Historical Background

The United States Air Force (USAF) gained its independence from the Army in 1947 largely because of the success of the strategic air bombardment campaigns in the European and Asian theaters during World War II. These campaigns were waged independently, i.e., not in direct support of the land and sea campaigns, but parallel to them. In fact, MacArthur's island-hopping strategy was designed to secure air bases for future raids on the Japanese homeland; some people might argue that this bombing

campaign was not merely co-equal to the land and naval forces, but actually a higher priority from the perspective that the ground and naval units were taking islands in order to enable air operations. In any event, the image of sunlight sparkling off a glistening B-29 as a single atomic bomb demolished the entire city below captured the public's imagination as the crowning success of American technology and war-fighting, bringing World War II to conclusion without another bloody invasion from the sea.

The Air Force was that silver and plexiglass bomber, flying at unimaginable altitude, speed and distance to deliver its deadly cargo to the enemy homeland. That was airpower, and airpower was the Air Force. Or was it? The Air Force had also expended considerable resources directly supporting ground operations in Africa and Europe, and its transport planes circled the globe, bringing men and supplies to where they were most needed. Then there were the Navy and Marine aircraft flying off carriers and islands to support amphibious operations in the Pacific. Where did they fit into this evolving picture of American airpower? Furthermore, what was the significance of the British radar-enhanced air defense and the German V-1 cruise missiles and V-2 surface-to-surface ballistic missiles for the future of airpower? The government granted the Air Force its independence without trying to nail down answers to these questions. After all, by the time the Air Force became independent in 1947, its primary justification—independent, mass bombing raids—was at best a practice whose days were plainly numbered in the face of atomic bombs, long-range ballistic missiles, radar and other technologies and innovations. Nevertheless, the Air Force was given



independence, perhaps because it was not felt necessary to gaze too far into the future. After all, the American form of government is based on the conflict of ideas, compromise, evolution, and endless repetition of that cycle. The Air Force and the other services would presumably follow the same model, and things would get worked out as they came up. The new Department of Defense, established concurrently with the Air Force in 1947 under the executive branch, and Congress would act as referees when necessary.

#### Caveats & Assumptions

The fundamental assumption in this manuscript is that piloting skill does not necessarily translate into generic leadership ability, a sense of vision, and problem solving skills in complex, stress-filled environments. I also assume that these qualities are illustrative of the types that the Air Force officer corps, as a profession, desires in its members. Furthermore, in an ideal situation, officers with such qualities would rise to the top, regardless of their career-field experiences, without any sort of quotas or allocations of certain positions to certain specific backgrounds. Consequently, my assumption is not that the ideal would be a perfect match in ratios between career fields at the general and non-general officer levels, but that over time, there would not be any heavy skewing in favor of any one career field at the general officer level.

This manuscript will not delve into the intricacies of how the Air Force defines its missions. The Air Force's missions are manifestations of jurisdiction. They are determined, albeit after a complicated political process in and between the executive



and legislative branches, by the federal, civilian government. For example, Congress passed legislation that authorized the Air Force to spend funds to develop, deploy and maintain a land-based ICBM force and to make the associated structural and personnel changes; the President signed it; and the Air Force implemented it. The Air Force affected the process in a variety of ways and at a variety of levels; so it is hardly fair to say that the Air Force was not a significant player in the political process. However, this manuscript focuses on what the Air Force missions are how they are changing, not how the Air Force acquired a particular mission.

There are important underlying assumptions tied to the issue of missions. The first is that the Air Force must allocate and train officers to fulfill the assigned functionalities. A second is that pilots will not be used extensively in non-pilot career fields, especially in lower ranks, because of pilots' cultural aversion to such work and because of structural requirements since 1975 for pilots to generally fly most of their first eleven years in order to qualify for continued flight pay.<sup>7</sup> The third is that these career fields will over time develop a standard pyramid shape. Fourth is that all officers enter the Air Force with roughly the same abilities, that there is a random scattering of abilities across all career fields, and that no particular career field is a dumping ground

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<sup>7</sup> Prior to 1975 flight pay was generally tied to continued flying, which generated a requirement for aircraft simply for pilots to fly and log their required monthly flight time in order to continue to receive flight pay even while attending courses or serving in non-flying positions. In the mid-1970s, the USAF switched to a system in which rated officers were required to meet a series of "gates," so many flying months per grouping of years of flying eligible service. If the rated officer meets his gates, the officer continues to draw flight pay while not flying for extended periods. The issue of flight pay and the effects of the two flight pay systems are covered in more detail in Chapter 8.

for the potentially inept or incompetent or for the best and brightest. Air Force pilot screening programs are ostensibly designed to cull out candidates that lack aptitude in presumed piloting skills, not generic officership or leadership skills. Consequently, merit-based promotions would distill proportional levels of top leaders across all career fields. Any skewing would then be the result of career field weighting, i.e., simply being in a particular career field increases or decreases the promotion chances of an equally capable officer.

Furthermore, it is difficult to analyze the Air Force from a functional perspective. Short of an event like actual war, there is no concrete and agreed way to measure the Air Force's functional efficiency to achieve its missions. In the case of actual wars, operations and exercises, the Air Force invests a good deal of effort trying to extract valuable "lessons learned" to improve its efficiency in future operations.<sup>8</sup> However, many missions, such as the Air Force's original 1947 founding mission, a combination of a World War II style strategic bombing campaign with the A-bomb, have never been battle-tested. Instead, simulations and field exercises of parts of the strategic attack system are used to test and to incrementally improve the Air Force's theoretical efficiency in this mission. As a result, the Air Force is presumed to efficiently fulfill this function without ever having actually performed it. The same holds true for the Air Force ICBM force, which, unlike the bomber force, has never been re-rolled into a conventional mode and used in non-nuclear strikes. The ICBM

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<sup>8</sup> For example, the Strategic Bombing Survey after World War II or the Gulf War Airpower Survey.

force and ICBM-connected officers are assumed to be capable of fulfilling their mission and that mission is assumed to be an integral part of Air Force combat power.

This study also does not deal directly with doctrine, strategy or tactics. A profession's articulation of its expertise obviously influences the development of doctrine, which in turn influences the development and execution of strategy and tactics. One could argue that a firmly entrenched doctrine could have considerable impact on how the organization sees itself and its mission or professional expertise. However, this study does not attempt to establish the precise relationship between doctrine, expertise, jurisdiction and profession.

This study is also not an attempt to define what it takes to be a general officer in the Air Force or to provide a cookbook-style recipe for junior officers intent on becoming a general. Such ideas run counter to the premise of the study, which clearly indicates that the concept of profession and the demographics of general officers are not static. In addition, careerism is hardly a tenet of profession.

### Definitions

“Air Force” officers come in many shapes and sizes, as does the Air Force’s statistical reporting on its officers. In its initial annual USAF Statistical Digests, the Air Force tracks Army and Navy officers serving with the newly independent Air Force. The last Army and Navy officers returned to their own services by 1956, but they are counted as part of the total “Air Force” officer statistics when serving with the Air Force. The Air Force also continued the tradition of warrant officers through 1980.



Warrant officers rank between commissioned officers and enlisted servicemen, but are frequently lumped in with officers in statistical reporting. After 1949, no warrant officers are reported as pilots on flying status.<sup>9</sup> In this study, I will not treat warrant officers as a separate category. Warrant officers will be contained in officer statistics when they cannot be, or are not, broken out.

The Air Force has also traditionally made a distinction between *regular* and *non-regular* officers, which continued through the statistical tables presented in the FY1980 USAF Statistical Digest. The contemporary presumption was that regular officers were career-minded and would form the backbone of the military in peacetime and war. From the Air Force's inception through the transition to the All Volunteer Force at the end of the Vietnam War, non-regular officers, i.e., those with Air Force Reserve or Air National Guard commissions, served on active duty for multiple-year tours, but generally would return to reserve or civilian status and would form the majority of officers in a mobilized military. However, to cloud the issue a bit, the Air Force has at times made a distinction between career non-regular officers and non-career non-regular officers. In addition, promotion-type boards for officer year-group cohorts have always been held at periodic intervals to select allotted numbers for regular status. These boards have also been divided at times into separate boards for

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<sup>9</sup> In their peak year, FY1958, warrant officers comprised 3.4% of the total commissioned and warrant officers. The annual USAF Statistical Digest series only listed 4 warrant officer pilots on flying status in FY1949, and none thereafter, and 1-4 warrant officer navigators on flying status between FY1949 and FY1952. The USAF Statistical Digest series continued to list warrant officer pilots and navigators not on flying status through FY1966.

rated and non-rated officers, in addition to the normal separate boards for non-line officers. The terms regular and non-regular are still in use, but the once important distinction is being eliminated. Traditionally, regular officers were either graduates of a military academy, top graduates from other commissioning sources like ROTC or OTS (regular status was not always awarded), or non-regular officers selected for regular status by the periodic boards. Regular status allows an officer to serve beyond 20 years of total active duty military service. This study primarily focuses on the total active duty Air Force officer corps and only breaks down into regular and non-regular when it highlights a difference or if the source data is only presented that way.

In addition, the initial Air Force promotion system was dual-tracked with each officer having a permanent as well as a potentially higher temporary rank. An officer's status as regular or non-regular came into play in certain conditions under this system. In this study, Air Force officers are presumed to be coded by their currently serving rank, regardless of whether it is temporary or permanent in the old system or permanent in the modern single-track system.

The Air Force officer corps can also be broken down into *line* and *non-line* officers. *Line* officers make up the vast majority of officers. They can be further divided into operations (flying, missiles, space, intelligence, etc.) and support (maintenance, supply, acquisitions, personnel, administration, etc.). Line officers, in year-group cohorts, are considered as a single group for promotion boards; so all line officers within a given year-group are competing for the same promotion slots. *Non-*

*line* officers are those serving as chaplains, lawyers, and a rather broad categorization of medical services. They meet separate promotion boards, and in general, fall under a different status with respect to the Geneva Convention. Women in the Air Force (WAFs) were reported in the annual USAF Statistical Digest through FY1970 in a table breaking out the non-line specialties. Lawyers were considered line officers until they were given a separate non-line promotion category in FY1971. This study uses both total active officer data as well as line officer data. Since non-line officers meet separate promotion boards and generally fall in a different Geneva Convention category, it is sometimes more meaningful to exclude them from comparisons with the pilot career field. At the same time, non-line officers are still Air Force officers, at times reaching 20% of the total number, and many statistics are only presented in terms of total officers. Consequently, this study uses both line and total Air Force officer data.

In addition, the Air Force frequently categorizes officers as *rated*, and *non-rated*. *Rated* refers to officers with flying ratings, who perform flight duties and receive flight pay. Initially, rated officers were broken down into *pilots* and *other rated*. Other rated were also called *observers*, a catchall term for a variety of what was later to become primarily bombardiers and navigators. The term *navigator* eventually became the catchall for what are now navigators, bombardiers, weapons system operators, electronic warfare officers, etc. In addition, flight surgeons, who are medical doctors and in the non-line category, were given rated status in FY1957, and air battle managers



(ABMs), who are line officers and evolved from ground-based intercept controllers to crewmembers on AWACS, JSTARS and other command and control aircraft, were given *rated* status in 1999 (FY2000). Air Force statistics also occasionally leave navigators out of the *rated* category or lump navigators into the *non-rated* category, which in theory is all non-rated officers and can include both line and non-line officers. This mis-categorization of navigators was presumably done out of ignorance.

There are different versions of pilots, navigators and rated officers. At the broadest level, *pilot* signifies an officer who has earned his pilot's wings at some point in his career, and may or may not still be on flying status. The annual USAF Statistical Digests reported this figure through FY1966. The next level down is a *pilot on flying status*, which means the pilot meets all the medical requirements for flying, and in the early years was probably still flying at a level sufficient to qualify for flight pay. In more recent times (post 1975), it means that the officer meets the qualifications to fly. The category *pilot on flying status* has been reported in the annual USAF Statistical Digests throughout the duration of this study. The next level is a *pilot receiving aviation career incentive (flight) pay*, which is reported from FY1976 onwards in the annual USAF Statistical Digests. In this case, the pilot meets the qualifications to fly, has met the required flying gates for his time of aviation service and has 25 or less years of service, or is actually flying if over 25 years of service. The next level down is a *pilot actually flying*, which means that the pilot is in a flying job and flying. This category also began being reported in FY1976. Finally, there are *pilot trainees*, who

have not yet qualified for the pilot rating. These trainees are included with pilots in some statistics and excluded in others. The categories are similar for navigators, and this study references all the categories. Aeronautical ratings can also be categorized along skill and experience lines, with pilots, for example climbing from the *basic pilot* rating to the *senior pilot* rating and further onward to the *command pilot* rating. However, the criteria for awarding the ratings have not remained constant, and this study for the most part uses the generic terms of *pilot* or *pilot on flying status* to signify all pilots or all pilots on flying status.

Finally, pilots and navigators can be broken down into specialties such as airplane, balloon or glider in the early years, or big aircraft and crews versus small aircraft and crews, or more typically fighter, bomber, tanker, transport, helicopter, and an ever-growing “other” category. Each category by its mere mention quickly brings to mind specific stereotypes and a pecking order of sorts within the flying community and Air Force officer corps at large. For the most part, this study examines pilots in total as a group. When subsets of pilots are analyzed for particular points, all subsets are not included because of space and research limitations.

### Methodology

I have used original source Air Force documentation as much as possible. As the bounds of this work became clearer, three major sources of data stood out. The first was the annual USAF Statistical Digest series, the second was promotion board data from recent Air Force field grade promotions, and the third was official Air Force

general officer biographies, available at the Air Force website.<sup>10</sup> Details on the sampling and coding process for the general officer biographies are provided in Appendix A.

The annual USAF Statistical Digests provided a wealth of information as well as general continuity of statistical data covering the time span from 1947 through FY2003. The annual USAF Statistical Digests presented the Air Force in terms of statistics that were available and deemed important at the time of publication; they not only trace the Air Force's history in data, they also carry cultural overtones. The pre-FY1990 versions were originally classified and written for internal Air Force, not broad public, consumption. Consequently, the earlier versions reveal more data on a variety of issues than the later ones. The 1947 USAF Statistical Digest was the logical place to start since it covered the beginning of the independent Air Force in September 1947. It is the second in the series and the first published by the newly independent Air Force.<sup>11</sup> The Foreword states that in the USAF Statistical Digest, "The more important data on the many activities and operations of the Air Force are brought together on a uniform basis to serve as an official and basic reference manual."<sup>12</sup> The FY2003 edition forms the

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<sup>10</sup> Most of the Air Force general officer biographies used in this manuscript were gathered over the course of several months and are available at the Air Force Website: <<http://www.af.mil/bios>>. If a biography for a particular general was not available on line, USAF Historical Study No. 91: Biographical Study of USAF General Officers, 1917 – 1952 was checked. If the biographic data was there, it was included in the manuscript database. See Robert P. Fogerty, United States Air Force Historical Study No. 91: Biographical Study of USAF General Officers, 1917-1952, Maxwell Air Force Base, Alabama: USAF Historical Division, Air University, 1953.

<sup>11</sup> The 1946 inaugural edition occurred when the Air Force was still part of the Army.

<sup>12</sup> Headquarters United States Air Force, Comptroller, Director of Statistical Services, United States Air Force Statistical Digest 1947 (Washington: HQ USAF, 1948) IX. For the duration of the manuscript,



other bookend since it was the most recent edition available when this project began. The USAF Statistical Digest series continued through the FY 1980 USAF Statistical Digest, after which the USAF Statistical Digest was discontinued until the FY 1991 Estimate USAF Statistical Digest. In the interim, many of the tables were still available in the USAF Summary series, which was discontinued upon the resumption of the USAF Statistical Digest. The USAF Statistical Digest series yielded a slew of information on everything from personnel to aircraft procurement issues; some providing spot looks, others providing continuous data for the duration of the study. However, as is the case in any compilation of this magnitude, the data is not always pristine. For example, the Air Force occasionally modified the statistical tables or its counting methods in data tables that at first look appear to be continuous and reported throughout the series. The Air Force comptroller's transition to computer-generated spreadsheets in the mid-1970s was also apparently not without problems since there are obvious errors within some data sets during this period. When data in the USAF Statistical Digest was missing or appeared to potentially be in error, I used data, if available, in Air Force Magazine to corroborate, correct, or fill in the gaps. For example, whether because of cultural influence, ignorance, or an unwillingness to change the template, the USAF Statistical Digest series does not provide data on Air Force space-related squadrons, but Air Force Magazine does dating back to 1989.

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the United States Air Force Statistical Digest series will be shortened to USAFSD in subsequent references.

Nevertheless, the USAF Statistical Digest series provided the bulk of basic Air Force statistics used in this work. When Air Force Magazine or other data is used, it is referenced in the text and in the chart.

The analysis of Air Force promotion data in Chapter 8 concentrated on Air Force historical data for line officer promotions to major, lieutenant colonel and colonel from FY1989-FY2002. This data was available at the Air Force Personnel Center's Website.<sup>13</sup> In addition, a smattering of earlier data from Air Force Times was used to develop a longer history. Promotion data to first lieutenant and captain were not used since the promotion rates for both ranks are extremely high, close to 100%. By contrast, the first real paring of the officer corps starts at the selection for promotion to the rank of major, which occurs at approximately an officer's 11<sup>th</sup> year of service, with promotion rates varying from 73% to 92% in the years studied. The promotion rates drop further at lieutenant colonel, at around 16 years of service, to between 63% and 72%. The rates take a more dramatic rate at colonel, at around 22 years of service, for which promotion opportunities ranged from 41% to 47%. Promotions are personally important since the current Air Force personnel system is based on the "up or out" concept, with maximum lengths of service prescribed for each rank. In general, an officer must be promoted to major in order to be able to stay in service for 20 years and qualify for retirement. Each officer has two opportunities for promotion below-the-

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<sup>13</sup> The 1989-2002 promotion data for field grade officers used to compute the differences of proportions and to build the various charts is from multiple visits over the course of three years to the USAF Personnel Center website: <<http://www.afpc.randolph.af.mil/demographics/>>.

promotion-zone (BPZ), one shot in-the-promotion-zone (IPZ), and tries after-the-promotion-zone (APZ) tied to tenure and current Air Force policies. Most officers who are promoted, are promoted IPZ. Percentages that are selected for promotion early or late are on the order of 1%. The Air Force stopped promoting officers BPZ to major in 1999. Chapter 8 contains graphs showing the promotion rates for various categories of line officers for each rank, i.e., major, lieutenant colonel and colonel. In addition, there are graphical depictions of the differences of proportions for the difference between pilot and non-pilot promotion percentages. For the older data, the differences of proportions reflect the difference between rated and non-rated promotion percentages.

#### Manuscript Layout

This manuscript is divided into four parts. The first part, Chapter 2, develops a descriptive model of profession for the Air Force officer corps, which under-girds the rest of the discussion. The second part, Chapters 3-6, examines the profession's expertise and the related concept of jurisdiction, developing the argument that C4ISR has become a critical expertise and an Air Force officer corps jurisdiction. The third part, Chapters 7 and 8, deals with the profession's corporateness, and in particular, the structural factors within the officer corps' history that created or perpetuated the overrepresentation of pilots in the general officer ranks. The final part, Chapters 9 and 10, presents an array of sample data from general officer biographies that illustrates both the evolution of the general officer corps and the increasing importance of C4ISR.



Chapter 2 focuses on the theory of professions and the development of a descriptive model of profession for the US Air Force officer corps. This chapter begins with two traditional works on the military as a profession: Samuel Huntington's The Soldier and the State and Morris Janowitz' The Professional Soldier. Huntington's basic concepts of expertise, jurisdiction and social responsibility form the foundation for my descriptive model. I borrow Janowitz' categorization of officers into the heroic leader and the military manager and transform them into my heroic warrior and visionary warrior Air Force officer archetypes, which are integrated into the descriptive model. I then add Andrew Abbott's concept that professions are dynamic, competitive and evolving in a world of changing jurisdictions from his book The System of Professions. *Jurisdiction* means society's or the government's recognition that a particular profession has competence to perform a particular type of work. The resulting descriptive model of profession for the Air Force serves as the definition of profession and provides the foundation for the remainder of this manuscript.

Chapter 3 begins the second part of the manuscript. It is the first of four chapters dealing with different aspects of the Air Force officer corps' expertise, missions, and jurisdictions. It examines what the Air Force officer corps' expertise should be from a theoretical perspective and provides a transition between the descriptive model presented in Chapter 2 and actual Air Force data on missions in Chapter 4. Chapters 5 and 6 assess the impact of technology. Expertise is important because of the role it plays in defining a profession. Expertise also plays a role in

defining differences between professions, and it provides a basis for a profession's jurisdictional claims. This is particularly important in the case of the Air Force officer corps because the division of the American military services along mediums, within which each predominantly operates, supports the public's perception that the Air Force officer corps' expertise is flying. This is problematic for a variety of reasons. First of all, it is not clear that flying is a skill that merits professional status. Furthermore, as the percentage of pilot officers has decreased, the officer corps appears to be shifting its weight of emphasis. For example, missiles and unmanned combat aerial vehicles increasingly encroach on the realm of manned-flight in combat. A profession based solely on flying manned combat aircraft runs the risk of obsolescence. Finally, the emphasis on flying could be obscuring the fact that flying is an important trade skill that supports a larger expertise. The chapter examines ideas on the expertise of the profession of officership offered by Carl von Clausewitz, Samuel Huntington, and Giulio Douhet. All three are important analysts of the military profession, and all three similarly conclude that the expertise of the profession of military officership has much more to do with the ability to process incomplete information and make higher-level decisions under the stresses of combat than it does with specific technical skills like firing a weapon or flying an airplane. In fact, by downplaying the technical skills of flying, maintaining and designing aircraft, Douhet opens the door for revolutionizing warfare through airpower, which is a much higher, more abstract expertise and claim

for jurisdiction. Consequently, I conclude that the Air Force officer corps' real expertise lies within the realm that von Clausewitz calls *military genius*.

Chapter 4 switches the basis of the argument from theory to data. The chapter examines data on the officer corps' missions and jurisdictions as the Air Force identifies them. However, the data is not based on what is said, but by how the officer corps organizes the Air Force and allocates its weight of effort. The Air Force's sense of mission, its aircraft, squadrons, personnel, and budgets all point to the fact that the work that the Air Force officer corps performs has not remained static over its short history. Instead, the Air Force officer corps' work and weight of emphasis between various types of work remains dynamic as the profession evolves in response to jurisdictional competition, the creation of new jurisdictions, and the demise of old ones. Furthermore, the data shows the increasing importance of command and control systems, or what the Air Force is now calling *C4ISR* (Command and Control, Communications, Computers, Intelligence, Surveillance and Reconnaissance), within the profession.

Chapter 5 is the first of two chapters that examines the interplay between technology, missions, jurisdiction and the migration of combat decision-making out of the cockpit into the command and control, or *C4ISR*, system. Chapter 5 focuses on how technological improvements to aircraft and weapons indirectly lead to the shift in decision-making. For example, as fewer aircraft are lost in accidents and during peacetime, the Air Force requires fewer aircraft. However, as the number of aircraft decreases, the importance of controlling them increases since the margin for error



decreases. The chapter also looks at the differing rates of change per aircraft types and concludes that officers that fly aircraft types that experience greater technological change are more accustomed to both changing and state-of-the-art technology. These officers are likely more visionary because of this. Finally the chapter examines the evolution of weapons. As Air Force weapons become more capable, there is a greater reliance on accurate and up-to-date intelligence and less dependence on pilot flying skills to employ them. The net result is that the locus of combat decision-making is migrating away from the cockpit into the command and control system.

Discussions on the heroic versus visionary warrior archetypes serve as a backdrop throughout the discussion. The heroic and the visionary warrior are not divided by the issue of technology *per se*. Both the heroic warrior and the visionary warrior must embrace new technologies. Maintaining the edge against potential enemies and jurisdictional competitors requires that neither be allowed to gain technical advantage over the Air Force officer corps. If the public were to doubt the Air Force officer corps' ability to meet its social responsibility to effectively and efficiently defend the nation, the public and government could potentially take away the Air Force officer corps' jurisdiction, or at least intervene in the profession and force changes. However, it is difficult to embrace only technologies that specifically support human pilots in the cockpits of combat aircraft. It is not a matter of accepting some technological improvements, like air-to-air missiles for example, but not others like an integrated command and control system. Each improvement to make the combat

aircraft more effective and more efficient is potentially another step towards the end of manned combat aircraft. Keeping the onboard pilot the centerpiece constrains technological development to the abilities of the weakest link—the man in the cockpit. Consequently, the heroic warrior must find new justifications for human pilots, while visionary warriors search for new ways to synergistically harness and command the emerging technologies.

Chapter 6 follows on the heels of the discussion on technology, aircraft and weapons because those factors are closely entwined with the evolution of the C4ISR system. More capable aircraft and more accurate weapons require evermore complex intelligence and command and control systems to maximize the potential of new targeting ideas and systems. Technology merges these systems together and shortens the decision-making cycle. Consequently, C4ISR is what ties it all together and makes Air Force operations both possible and successful. As a concept, C4ISR is the embodiment of von Clausewitz' *military genius*, which when coupled with visionary forms of warfare becomes an expertise in search of a jurisdiction. Furthermore, it is an expertise that ignores the current medium-based jurisdictions of warfare. As technology, however, C4ISR is an essential tool through which commanders can exercise *military genius*. The command and control aspect of C4ISR is not a new concept for the Air Force officer corps since the driving idea behind the independent air force movement was the promise that centralized control over aircraft would allow air forces to quickly mass at critical points and times in battle. A historic review of the

evolution and the role of the command and control system highlights the impact of technology as well as the differences between the heroic and visionary warrior archetypes. In addition, it also reveals some differences in the concept of command between the Air Force officer corps and those of the other services. Finally, as with the development of weapons technology, the ever-increasing intrusion of the command and control system into flying operations raises the issue of whether flying skills can over the long run continue to dominate Air Force officer corps discussions of command, leadership, and expertise.

Chapter 7 begins the third part of the manuscript, which concerns the explanation for why pilot general officers have been able to maintain their overrepresentation while the pilot overrepresentation has disappeared in the lower ranks. That explanation lies in structural factors and traditions that largely evolved out of the Air Force officer corps' struggle for independence. In particular, Chapter 7 examines two early Air Service and Air Corps stratagems that became public law, and thereby restricted the independent Air Force officer corps' ability to evolve. The first of these was the concept that the Air Service officer corps should be 90% flying officers, and the second was that only pilots could command flying units. The chapter also includes case studies of the navigator and of the air battle manager career fields' difficulties in overcoming these obstacles. The chapter concludes with a short look at the interconnections between ratings, command of flying units and the Air Force tradition of badges and wings to illustrate recent changes that raise the status of the air



battle manager and space career fields. The air battle manager and space career fields comprise a large part of the officers serving in C4ISR.

Chapter 8 continues the discussion begun in Chapter 7 on structural factors within the Air Force and its officer corps that have created or perpetuated the overrepresentation of pilots at the general office level. Although Chapter 8 actually digs a bit deeper in detail, it is easier to explain the chapter with some higher level questions. The first question is whether pilots need to be officers. Although the Air Force officer corps has emphatically answered this question with a “yes” since achieving independence, the question serves as a springboard for examining the impact of Air Force officer commissioning sources on membership in the officer corps’ inner core. The Aviation Cadet Program merits special attention because of the program’s long shadow on the composition of the officer corps, and the fact that the program minimized the importance of education and officer training while maximizing the importance of flying skills as the criterion for officership. The chapter then moves to another seemingly elementary question, i.e., how many pilot officers does the Air Force officer corps actually need? The answer to this question lies in ratios of pilot to aircraft, flight pay and bonuses, and the officer corps’ tradition of carrying an active-duty pilot reserve cloaked in non-pilot billets. The third and final section of the chapter examines field grade officer promotions for bias in favor of pilots or rated officers since promotion bias could at least partially explain the overrepresentation of pilots in the general officer ranks.

Chapter 9 begins the fourth and final part of the manuscript, bridging the gap between the second and third parts. The third part explains why the pilot overrepresentation persists in the general officer ranks despite the dramatic changes outlined in the second part with respect to the Air Force officer corps' missions, jurisdictions, and composition. Since the general officer ranks are over-proportionally pilot, they might be presumed to also be over-proportionally heroic warrior. However, the profession's sense of social responsibility requires it to stay abreast of or even lead changes in the character and nature of war. This would seem to require that the general officers be visionary warriors. The missing piece of the puzzle, the piece that reconciles these opposing perspectives, is that the characteristics of the line general officer corps are also evolving.

Chapter 9 examines the evolution of the line general officer corps using sample data from general officer biographies across several variables that highlight the heroic versus visionary warrior debate. The evolution in the *initial* and in the *apparent Air Force Specialty (Career Field) Codes* captures the diversity of career fields being accepted into the inner core of the profession as the percentage of non-rated general officers increased. It also provides data on the relative status of various career fields as measured by officers who have changed specialties during their careers. The second variable can be loosely described as *the use of pilot skills as proxy variables for leadership and decision-making*. It traces the shifting weight of emphasis given to things like total flying hours, combat sorties and *hot stick*, or great pilot, indications in

the general officer biographies. These provide indications of how valued pilot skill was in a given sample. The next variable concerns what levels and what types of unit general officers have commanded. Although *command* has had less and less to do with combat as time goes on, it is nonetheless important because it appears to be a required statement in the biographies from the more recent samples. In addition, changes in the types of units or percentages of commanders indicate shifts between the heroic and visionary perspectives. A statement on *professional military education* appears to also be a requirement in the more recent biographies. Attending intermediate and senior service schools is important because, unlike doctors, lawyers and ministers, military officers receive much of their professional training midway through their careers. If large numbers of officers reach general officer rank without the professional military education, it would call the entire system into question. The *career broadening* variable examines whether general officers tend to be promoted as specialists, whether in rated or non-rated capacities, or generalists. The more generalist the upbringing, the more visionary the officers potentially are. The last variable examined in this chapter is termed *exotic characteristics*, which contains different types of exotic duty tours that general officers may have served. As with career broadening, it provides an indication of the value the general officer corps places on such vision-expanding tours. In addition, observable trends in sub categories like service as an aide or in legislative liaison could signal major changes in the understanding of profession within the general officer corps.



Chapter 10 provides an in-depth examination of a variety of C4ISR indicators in the general officer sample data to document the increasing importance of C4ISR to the general officer corps. A determination that officers serving in C4ISR billets are part of the inner core of the Air Force officer corps profession provides strong support for the contention that the Air Force officer corps' sense of mission and membership has been and is continuing to shift away from a flying emphasis based on pilot officers towards a broader perspective of visionary warfare that is based on C4ISR technology and officers with C4ISR experience. The chapter begins by documenting the clear trend of increasing percentages of general officers with apparent C4ISR career field codes. Although the trend shows clear increases in C4ISR general officers, the numbers are still quite small. Consequently, the chapter also examines the percentages of line general officers who reported serving in C4ISR jobs in various rank categories. Broad C4ISR experience among line general officers in the lieutenant colonel and below ranks would indicate long-term exposure to C4ISR as well as that the experience is valued. Finally, the chapter analyzes the trend of the increasing wear of non-rated badges, and in particular space and missile badges, by line general officers as another indication that the general officer corps has not only become increasingly aware of the importance of C4ISR, but has increasingly become more experienced in C4ISR and visionary forms of warfare. The manuscript concludes with a brief examination of the implications of the total argument.

## **Chapter 2: A Descriptive Model of Profession for the US Air Force**

### Introduction to Profession

This chapter focuses on the theory of professions and the development of a descriptive model of profession for the US Air Force officer corps. *Profession*, of course, is used in the sense of an occupation with a special status, such as that ascribed to doctors and lawyers in Western society; as opposed to the sense of a *professional* baseball player getting paid and an amateur playing for fun. This chapter begins with traditional works on concepts of profession within the military, Samuel Huntington's The Soldier and the State and Morris Janowitz' The Professional Soldier, to establish the foundation of military officership as a profession. Huntington's definition of the military profession and his basic concepts of expertise, jurisdiction and social responsibility are examined. These concepts form the foundation for my descriptive model. Janowitz' categorization of officers into the heroic leader and the military manager is analyzed, which leads to my transformation of them into the heroic warrior and visionary warrior Air Force officer archetypes. These two archetypes also form part of my descriptive model. I then turn to Andrew Abbott's The System of Professions, paying particular attention to his major concept that professions are dynamic, competitive and evolving in a world of changing jurisdictions. *Jurisdiction* is societal or governmental recognition that a particular profession has competence to perform a particular type of work. My descriptive model combines Huntington's pillars of expertise, responsibility and corporateness, my adaptations of Janowitz' heroic

leader and military manager archetypes, and Abbott's emphasis on the work the profession actually does and its jurisdictional status. The resulting descriptive model of profession for the Air Force serves as the definition of profession and under-girds the remainder of this manuscript.

### Samuel Huntington

Samuel Huntington's The Soldier and the State is the classic beginning for discussions on the issue of profession and the modern, post World War II, US military. Huntington's book was first published in 1957, ten years into the history of the independent Air Force. It would not be a stretch to say that all Air Force officers are familiar with Huntington's definition of a profession involving expertise, responsibility and corporateness, and the military's expertise being the management of violence. The division of profession into three points appears almost custom-designed to match traditional military briefing techniques. Slides similar to the one below have been used at the Air Force Academy, in the various levels of professional military education, and presumably in a variety of other military forums.<sup>14</sup>

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<sup>14</sup> Professional Military Education (PME) refers to an officer's higher-level, academic-style education in military institutions designed to prepare officers for future jobs in higher positions. PME typically provides instruction in practical skills and theoretical concepts. Practical skills involve things like how to do staff work or plan an air campaign. Theoretical subjects include issues like doctrine, what is war, civil-military relations, international affairs, etc. The Air Force Academy is not considered PME. The current PME ladder and designations are Squadron Officers School (SOS) as a lieutenant or captain; Air Command and Staff College (ACSC) as a major; Air War College as a lieutenant colonel or colonel; CAPSTONE as a brigadier general. PME does not include technical training or flying training, which refer to job-specific training to be a maintenance officer or fighter pilot, for example.



## Huntington on Professions

- Military is a Profession
- Professions have
  - Expertise
  - Responsibility
  - Corporateness

Figure 2-1: Huntington on Professions

No American military officer would disagree with Huntington's statement that "the modern officer corps is a professional body, and the modern military officer is a professional man."<sup>15</sup> The officer corps has long considered itself a profession, but Huntington's The Soldier and the State provided a logical argument to buttress the claim, academic recognition of the claim, and a basis for the indoctrination of successive generations of military officers. His defining characteristics of a profession, that is *expertise*, *social responsibility* and *corporateness*, match the officer corps'

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<sup>15</sup> Samuel P. Huntington, The Soldier and the State: The Theory and Politics of Civil-Military Relations (Cambridge, MA: Belnap Press, 1985) 7.

conception of itself and its long-standing belief that officership is a “higher calling,” at least on par with lawyers, doctors and ministers.

Huntington’s definition of *expertise* follows:

The professional man is an expert with specialized knowledge and skill in a significant field of human endeavor. His expertise is acquired only by prolonged education and experience. It is the basis of objective standards of professional competence for separating the profession from laymen and measuring the relative competence of members in the professions. Such standards are universal. They inhere in the knowledge and skill and are capable of general application irrespective of time and place. The ordinary skill or craft exists only in the present and is mastered by learning an existing technique without reference to what has gone before. Professional knowledge, however, is intellectual in nature and capable of preservation in writing. Professional knowledge has a history, and some knowledge of that history is essential to professional competence. Institutions of research and education are required for the extension and transmission of professional knowledge and skill.<sup>16</sup>

Huntington goes on to discuss the importance of the connection between the academic and practical aspects of a profession and the use of tools such professional journals and conferences and the rotation of professionals between practical and teaching experiences to entwine and ground the professional in both aspects as well as the past, present and future of the profession. Education and experience are the foundations of a profession. Huntington further divides education into two levels. The first is a broad, liberal arts style education that provides the requisite foundation upon which the second, the specific profession-oriented education, is built. The second level not only imparts the specific knowledge necessary to do the profession’s work, but also knowledge of the history of the profession and its place and function in society.

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<sup>16</sup> Huntington 8.

Huntington's purpose was not to define expertise for eternity, but to put down a workable definition so that he could move on to his main topic of civil military relations. His definition is not designed to withstand an intense assault, and it is not my intent to make it into more than it is. However, since the Air Force and military in general are keen to use Huntington as a basis for discussions on the military profession and because I use Huntington's terms in my descriptive model, a few points are in order. First, although Huntington does not clearly state it, it seems clear that an underlying premise is that a profession's knowledge is exclusionary, i.e., two or more professions do not share the same expertise. Lawyers and doctors may share clients, but when people feel sick they go to the doctor and when they think that they need legal assistance they go to lawyers. Second, one could argue at great length over what exactly terms like *specialized knowledge*, *skill*, *significant field of human endeavor*, and *intellectual in nature* mean, but as in Huntington's work, it is not possible, nor desirable, to categorize every conceivable case in detail. It is enough to capture the general intent. However, these topics as well as Huntington's determination of the military officer's expertise will be discussed in more detail in the next chapter.

*Responsibility* means that the professional, by employing his expertise, is performing an essential role in both the basic existence and the general functioning of society at large. Furthermore, Huntington implies that there is a social contract of sorts involved here. Society has granted the profession the right to monopolize its area of expertise, and in return, the professional will perform the monopolized function when



needed by society. Consequently, this obligation overrides the professional's interest in payment for his services as his primary motivation. This, of course, is not to imply that the professional does not expect to be compensated for the provision of his service. The profession, as such, must then regulate the behavior of its members between themselves and with society at large so that society feels that the profession meets its obligations and thereby can continue its monopoly concession.<sup>17</sup> This then ties into *corporateness* since the profession must be organized to establish and enforce standards as demanded by the obligations of social responsibility. The profession must also regulate membership and set standards of minimum competency and experience.

Huntington admits that no profession matches the ideal, and that the military falls shorter of the ideal than the more traditional professions of law and medicine. Nevertheless, he includes officership in the professions, partly because "officership is strongest and most effective when it most closely approaches the professional ideal."<sup>18</sup> In other words, it is best for the military to be striving towards the professional ideal than for the officer corps to be denied professional status by society and academia and cast adrift to search on its own for some sort of unifying sense of purpose. That could be dangerous, even in a democratic society.

Huntington's three points provide a good structural basis for the descriptive model on officership as a profession. *Expertise* is the profession's peculiar knowledge

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<sup>17</sup> Huntington 9.

<sup>18</sup> Huntington 11.

and skill. It is what the profession knows, teaches and thinks that it can do.

*Responsibility* captures both a sense of higher calling in the rather nebulous ideal of defending the nation by forfeiting one's life if necessary as well as an agreement of sorts to actually provide that service if called upon. It is why the profession does what it does. *Corporateness* concerns who makes up the profession and how the member and profession as a whole are regulated. Finally, although Huntington treats each point in isolation and in the seemingly static early Cold War situation, there must be significant interplay between the three concepts. Modifying one surely affects the others. For example, society might say that it wants the military to not just manage violence abroad, but also to be a disaster relief profession. This would entail a renegotiation of the existing contract of social responsibility, a broadening of military expertise, and potentially a modification of its personnel and personnel procedures to accommodate the new area of expertise. Consequently, the figure below transforms the simple and static Huntington three-bullet briefing slide presented earlier into a more complex picture. Expertise, corporateness and responsibility are all parts of the same thing—the profession—and the demands of each interact with the others within the profession. The light blue arrows symbolize this interaction. We now take this adaptation of Huntington forward to see what insights a study of Janowitz might add.

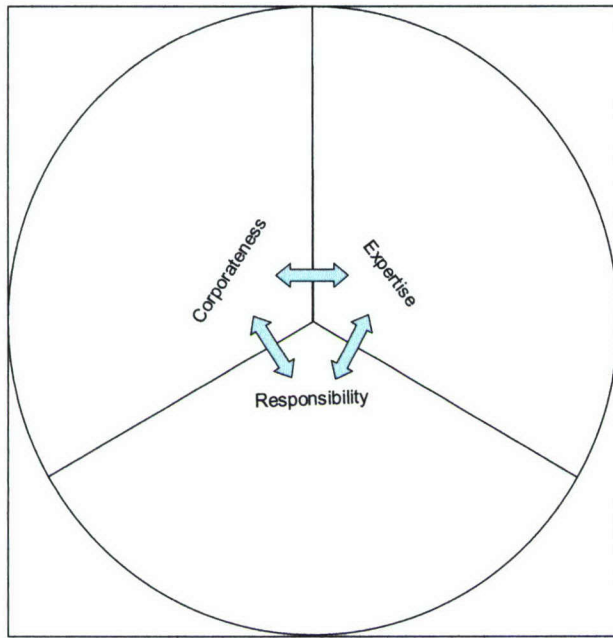


Figure 2-2: Huntington as the Basis of the Descriptive Model

### Morris Janowitz

In his seminal work, The Professional Soldier: A Social and Political Portrait, Morris Janowitz analyzes social and political changes in the US Army's and the Department of the Navy's highest ranking career officers over roughly the first half of the 20th century. He also includes Air Force officers, but a large part of the Air Force's history is still entwined with the Army during the period of his study. As with Huntington, Janowitz uses the concept of profession as a tool to analyze changes in the US military officer corps. Janowitz does not provide a three bullet point definition of profession, and in fact treats it more as a way to simply categorize officers as a specific



group of interest.<sup>19</sup> Janowitz focuses on the changing social makeup of the officer corps, specifically its evolution from a homogenous, somewhat aloof and pseudo aristocratic social group to a diverse group that is more representative of American society. In fact, the Air Force leads the other services in terms of the transition to this new officer corps. Like Huntington, Janowitz is primarily concerned about what he sees as clear implications for civil-military relations in this evolution, which leaves the military's officer corps caught between the historic traditions and ties of officership as a profession on one side and a gradual civilianization of the officer corps on the other. Janowitz makes several points that are relevant to this study. Although he provides a fuzzier image of officership as a profession, Janowitz presents two officer archetypes, the heroic old school and the civilianized military manager, that exemplify the divide that he sees growing in the officer corps. In addition, he works through several supporting hypotheses with examples that tend to illustrate large differences between the individual services' officer corps.

Janowitz is less structured than Huntington in his approach to defining officership as a profession. Janowitz' primary thrust is to use the officer corps as a way to capture the leadership of all services in a single group for study and comparison. Consequently, his style is to tangentially touch on officership as a profession with a variety of examples, without getting bogged down in specific definitions. For example,

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<sup>19</sup> Janowitz tends to keep his definitions at a very high level or not provide them at all. Janowitz also tends to loosely use terms such as doctrine, strategy and tactics; or *military*, when he appears to mean one particular service.

he writes that officers often see parallels between their own lives in the military and the presumed life of a minister. In fact, many officers indicated to him that they wrestled over the whether to join the military or the ministry at the beginning of their careers. Janowitz also points out that some resigned officers find a home in the clergy with its parallel system of organizational membership and sense of calling. He also quotes a letter from a retired Navy captain to his son in the Navy, written in 1913 and widely distributed thereafter. The sentiments in the letter still resound with military professionals today:

The naval profession is much like the ministry. You dedicate your life to a purpose. You wear the garb of an organized profession. Your life is governed by rules laid down by the organization. You renounce your pursuit of wealth. In a large measure you surrender your citizenship; renounce politics; and work for the highest good of the organization. In the final analysis your aims and objects are quite as moral as any minister's because you are not seeking your own good, but the ultimate good of your country. You train the men under you to be good and useful citizens, and, like the minister, what you say must conform to the rules of the organization.<sup>20</sup>

This description typifies Janowitz' perspective. The emphasis is on the organization and the individual officer's obligations to it. The officer must subordinate himself to the organization's intrusive rules and dedicate himself to work for the organization's highest good. However, there is no real mention of any expertise. Consequently, in Huntington's terms, Janowitz is interested primarily in corporateness and responsibility. Janowitz does not completely neglect to mention expertise though.

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<sup>20</sup> Morris Janowitz, *The Professional Soldier: A Social and Political Portrait*, 12<sup>th</sup> printing (New York: Free Press, 1971) 115.

For example, he labels honor, public service, and career commitment as “the traditional dogmas of the military profession,” then distills the essence of the professional soldier to being a man who *always fights*.<sup>21</sup> A professional officer does not turn down combat assignments or opportunities for combat. This is a rather limited description since it does not avail itself to traditional concepts associated with the military expertise like leadership or management of men or a specific expertise that requires special study and training. In addition, only an officer in a position to experience combat could conceivably turn down combat assignments. Consequently, Janowitz implies that only a select portion of the officer corps, those in combat arms are the core of the profession. In fact, he specifically deals with this issue in one of his supporting hypotheses. In the Air Force case, this would only be a small portion of the Air Force officer corps, principally those pilots of fighter, attack and bomber aircraft.

The essence of Janowitz’ argument is manifest in his characterization of officers as being one of three (actually two) types: 1) The heroic leader, who embodies “traditionalism and glory;” 2) The military manager, who is “concerned with the scientific and rational conduct of war;” and 3) The military technologist, or technical specialist.<sup>22</sup> However, Janowitz also wrote that, “The military technologist is not a scientist, or for that matter an engineer; basically he is a military manager, with a fund of technical knowledge and a quality for dramatizing the need for technological

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<sup>21</sup> Janowitz 367, 217-225.

<sup>22</sup> Janowitz 21.



progress.”<sup>23</sup> That means that Janowitz actually only has two archetypes—the heroic leader and the military manager. Furthermore, Janowitz admits that many officers are actually composites, exhibiting characteristics of each at times. To Janowitz, “the heroic leader is a perpetuation of the warrior type, the mounted officer who embodies the martial spirit and the theme of personal valor.”<sup>24</sup> He is the military professional who always fights. On the other side, “the military manger reflects the scientific and pragmatic dimensions of war-making; he is the professional with effective links to civilian society.”<sup>25</sup> The military manager is looking for efficiencies in war and is open to technology, but the heroic leader does not embrace technology and prefers traditions and cavalry charges. These officer types also embody the overall point of his book, i.e., the post World War II US military officer corps is caught in a struggle between the two conceptions of: 1) The military as the traditional profession; and 2) A civilianization of the officer corps. Janowitz sees the struggle manifested in changes in leadership styles (authoritarian versus manager), officer corps composition (small, “aristocratic” versus large and diverse), officer skills (combat versus technical and administrative), officer corps tolerance for innovation (limited versus embracing), and thinking skills (limited versus critical).

Janowitz admits that his distinction between civilianized managers and heroic leaders is harder to make in the Air Force case than in the other services since the new

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<sup>23</sup> Janowitz 164.

<sup>24</sup> Janowitz 21.

<sup>25</sup> Janowitz 21.

technology of the airplane can arguably be placed under both categories. On the one hand, at least in the first half of the 20th century, only a heroic type would dare take wing in a flimsy flying machine, facing death by accident as much as by enemy action. On the other hand, embracing the airplane as a technological innovation bringing new efficiencies to industrial-age warfare is clearly managerial by Janowitz' description. Janowitz cast his lot and lumped the flying of new airplanes under heroic leadership. He then asserted that the Air Force consequently had the highest concentrations of heroic leaders in the general officer ranks. Furthermore, without explanation, he states that this heroic style was most apparent in bombers, which also had the highest prestige in the Air Force. Air Force military managers were more associated with tactical air forces and air transport, both of which were heavily involved in joint operations.<sup>26</sup>

Janowitz sows some confusion when he further divides the military manager into *absolutists*, meaning officers who think of war in terms of winning or losing, and *pragmatists*, officers who see a clear tie between war and its political consequences and that war can be fought for objectives short of destruction of the enemy.<sup>27</sup> Since he already labeled the military manager as a pragmatist, it would seem that these terms might better distinguish between the heroic leader and the military manager, but Janowitz discounts the future of the heroic leader. Furthermore, he states that both the absolutist and pragmatists base their arguments in rationality. Presumably, the heroic

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<sup>26</sup> Janowitz 161.

<sup>27</sup> Janowitz xli, 264-277.

leader is not based in rationality. The absolutists try to adjust the means to secure the end of total victory, and the pragmatists adjust the ends based on the means. Janowitz also ascribes the conduct of the war in the Pacific against Japan to absolutist leaders. American generals in the European theater during World War II used a more pragmatist approach. In addition, absolutists tend to come from the “fortress America” view of international relations and the pragmatists tend to believe in a system of international alliance.<sup>28</sup>

In the end, it is clear that Janowitz’ overarching premise is that the change in the social and political makeup of military officers is changing the nature of the profession. Consequently, his conception of officership as a profession is not static; the profession is in flux. If one applies Huntington’s concepts of expertise, responsibility and corporateness to Janowitz’ work at large, it is clear that Janowitz escapes almost any discussion of a peculiar military expertise, sidesteps the issue of who, from a career specialty point of view, is in the profession, and demonstrates major differences between the services in terms of senior officer experience and outlooks. However, he repeatedly refers to concepts like *honor* and a *sense of calling* (responsibility) as part of the basis of the profession. Nevertheless, his archetypes can provide the basis for a more differentiated analysis along Huntington’s terms of reference.

However, Janowitz’ main emphasis in 1960 was that the military manager was on the ascendancy, and the heroic leader was fast disappearing. The Air Force bomber

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<sup>28</sup> Janowitz 259-273.



pilot was a last bastion of the heroic leader, but he too was no doubt destined to transition to civilian style management techniques. This study borrows Janowitz' idea of the competition between the two prototypes but modifies the archetypes slightly. Today, the case can be made that the archetypical heroic leader lives on in the form of the combat pilot. For example, the combat pilot still counts *coups*, although in an updated sort of way.<sup>29</sup> Modern Air Force general officer biographies, whether destined for internal Air Force consumption or presented when the general is a candidate for a board position in an insurance company, invariably contain a sentence along the lines of: "General X is a command fighter pilot with more than 3,100 flight hours," or "He flew more than 100 combat missions in Southeast Asia." These statements, as well as the mention of medals for specific combat actions or medals like the older interpretation of the Air Medal or modern Aerial Achievement Medal, which are specifically tied to numbers of combat missions, clearly say, "I've risked my life YY times in combat," or "I've spent 3,100 hours of my life defying death while piloting aircraft." They are counting *coups*, and exemplify the old warrior traditions—a professional officer always fights.

However, unlike Janowitz' description of the heroic leader, my Air Force heroic warrior archetype is not particularly authoritarian, aristocratic, or against technology. He is also not automatically a "leader." He is, however, tradition bound in the sense

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<sup>29</sup> Counting *coups* was a Native American tradition in which a warrior would demonstrate bravery in battle by physically touching a worthy opponent in battle. Each touch was a *coup*; so a warrior with many *coups* demonstrated his bravery many times.

that he would stand by the axiom, “The job of the Air Force is to fly and fight, and don’t you forget it!” He has a sense of responsibility to the nation, but this ethos is flavored by his perceptions of the Air Force officer corps’ expertise and sense of corporateness. To him, the Air Force officer’s expertise is the delivery of weapons from manned aircraft. This formulation already shows a separation from the Air Force’s initial basis of independence, strategic bombing, and an acceptance of technological innovation on the part of the heroic warrior. In addition, he naturally sees the composition of the Air Force officer corps as paralleling the expertise. He expects pilots to predominate in both quantity, and quality in terms of manning senior, key and combat-critical positions.

Janowitz contrasted the heroic warrior with the military manager. However, this study uses the term *visionary* and *warrior* instead of *manager* for a variety of reasons. First of all, within the military profession, *manager* has negative connotations. Whereas officers *lead* people, a storekeeper *manages* his inventory, the organizational man *manages* various undifferentiated projects, and a bureaucrat *manages* a robotic bureaucracy. Second, because the Air Force simultaneously uses two different, but overlapping systems for organization and leadership/management, the terms *leader*, *manager*, *command*, and *command and control* can quickly become hopelessly confused. Finally, in the Air Force, *vision*, as evidenced by both pilots and other officers, is the counter to the heroic traditionalist, although both were critical to the Air Force’s independence. However, by the time the Air Force became independent in

1947, its primary justification—independent, massed, and heroic strategic bombing raids—was already a piece of history, or at best a practice whose days were plainly numbered in the face of atomic bombs, long-range ballistic missiles, radar and other technologies and innovations. As Janowitz noted:

Despite the ascendance of air power, the typical Air Force colonel or general had the least consistent self-image. Air Force traditions are not powerful enough to offset the realization that, in the not too distant future, heroic fighters and military managers will be outnumbered by military engineers. Air Force officers were fully aware, but reluctant to admit, that more of a “leadership” role would reside in the Army and in the Navy.<sup>30</sup>

Janowitz’ prophecy has not come to pass. Military engineers do not exist as a separate archetype in the Air Force. They are subsumed into the prevailing heroic warrior and visionary warrior archetypes. The focus of the officer corps remains war, not airplanes and technology, and the contentious issues are how that war should be conducted and by what types of people. Consequently, the Air Force officer corps was not shunted off into a technical track that could only support military courses of action determined by more broadly minded Army and naval officers.

It is important to note that the archetypes are just that. They are representations of particular characteristics and points of view, used as tools to clarify different positions in the analysis of my puzzle, i.e. why the percentage of Air Force pilot generals declined from over 90% to 60% over the course of the independent Air Force’s history. Pilots are probably more likely to take on the mantel of the heroic warrior

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<sup>30</sup> Janowitz 228.



archetype, but it is not meant to be exclusive of other career fields, nor is meant to be all-inclusive of every pilot. Pilots, as well as officers in other career fields, also fall under the visionary warrior rubric. In reality, many officers probably exhibit characteristics of both archetypes in different situations or under different conditions. For this study, however, the heroic and visionary archetypes struggle to define just who is in the Air Force officership profession (corporateness) and what work (expertise) exactly encompasses the profession's self-concept; for this forms the basis of claims for jurisdictional competence.

Consequently, the descriptive model now looks like the diagram below. Huntington's pillars of *expertise*, *responsibility* and *corporateness* form the inner circle, with the light blue arrows indicating the interplay between the three concepts. The outer ring depicts the two archetypes of *heroic warrior* (teal blue) and *visionary warrior* (purple), broken out into each of Huntington's pillars. The red arrows in the outer ring indicate the tension between the heroic warrior and visionary warrior archetypes in the areas of expertise and corporateness. Expertise tends to be dominated by the visionary archetype, as illustrated by the long-standing involvement with a variety of missile types, the growing influence of command and control systems in the profession, and the recent introduction of unmanned combat aircraft. Technology has a large impact on expertise. The concept of corporateness is most heavily dominated by the heroic archetype since things from uniforms and pilot wings, to education, promotions and discussions as to whether non-pilots are really members of the profession or are fit to

command fall in this bailiwick. Responsibility is depicted as being equal between the archetypes since both feel the obligation in similar terms; there is no struggle over the pillar of responsibility.

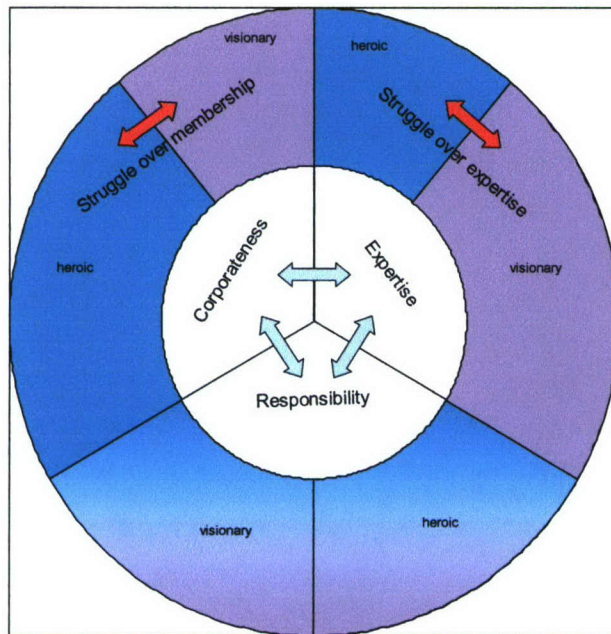


Figure 2-3: Janowitz-Type Modifications Added to the Descriptive Model

### Andrew Abbott

Andrew Abbott, in The System of Professions, changes the focus of the study of professions from the analysis of organizational structures of existing professions to an analysis of the work that the professions actually do. This shift in focus leads to different perspectives on how professions are created, exist, evolve, and perhaps decline. Through the examination of professions' work, it quickly becomes evident that many professions are actually doing very similar work. In fact, they are often

competing with each other in a particular line of work. In Abbott's terms, they are competing for jurisdiction over this particular line of work.

Abbott's classic example is the case of the treatment of mental illness. At various times, jailers, ministers, medical doctors, psychiatrists, psychologists, sociologists, case workers and others have sought or been given jurisdiction over the mentally ill. If one uses the more standard structural approaches, along the lines of Huntington for example, to studying professions, then some of the occupational groups immediately drop out because they are not considered *professional*. Jailers, in particular, lack an expertise with dealing with the mentally ill, they are not particularly well educated, they do not have a particular sense of corporateness, nor does society view them as carrying a particular burden of social responsibility. Finally, and in many ways the most important factor in studying professions in general, is the fact that society does not think of jailers as professionals. Society does not accord them professional status. Psychologists possess in-depth, specialized training for dealing with mental illness, they do have a sense of corporateness, and they are accorded responsibility along the lines of a medical doctor. Therein lies the problem though, since they are not medical doctors. They are not psychiatrists, who as medical doctors are seen as a traditional profession. They are somewhere between jailers and psychiatrists, though obviously closer to psychiatrists. They could be considered psychiatrists' helpers, but psychologists argue that they are the equals of psychiatrists.



Psychologists have different training, different knowledge and skills, and treat different problems than psychiatry.

Definitions and prisms become important because they help form jurisdictional boxes. It is fairly easy to recognize a person's behavior as being somehow different. But once one moves on to the next step and tries to categorize the difference, people become trapped in words. Diagnoses and treatments tend to be paired in peoples' minds, and this forms part of the basis of a profession's claim to jurisdiction over particular cases. People with the devil in them are best treated by men of god. People who are just plain crazy are bound for permanent stays in jail or the asylum. People lacking a bit of self-discipline will get straightened out by a hitch in the Army. Artists, being creative, are supposed to be a bit different, and people with a mental illness are best treated by medical professionals, et cetera.

Society does not come up with the labels, then create professions to handle them. As knowledge, technology and culture change, professions develop to fill emerging voids or established professions move to cover the emerging voids. Voids may also develop when a profession moves to cover a new jurisdiction and either leaves its old jurisdiction, or no longer is in a position to control it.<sup>31</sup> Professions may also create the perception that there is a void. There is obviously a strong similarity to business marketing concepts. In any case, professions play a role in the labeling

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<sup>31</sup> Andrew Abbott, The System of Professions: An Essay on the Division of Expert Labor (Chicago: University of Chicago Press, 1988) 3.

process, which in turn affects which profession gets to handle the problem. This is a key part of Abbott's concept of jurisdiction:

But to perform skilled acts and justify them cognitively is not yet to hold jurisdiction. In claiming jurisdiction, a profession asks society to recognize its cognitive structure through exclusive rights; jurisdiction has not only a culture, but also a social structure. These claimed rights may include absolute monopoly of practices and of public payments, rights of self-discipline and of unconstrained employment, control of professional training, of recruitment, and of licensing, to mention only a few. ... The claims also depend on the profession's own desires; not all professions aim for domination of practice in all their jurisdictions.<sup>32</sup>

This simple example indicates that the competition can become quite complex, because definitions of the work itself, the jurisdiction, and who or what actually forms the profession itself are in flux. In addition, professions may arrive at compromises and share jurisdiction, as between psychiatrists and psychologists.

Although Abbott does not delve at any length into the military as a profession, his work provides a catalyst for further exploration of the military profession. Although he sometimes treats the military *in toto* as a profession, he does imply at points that each service is an individual profession.<sup>33</sup> The traditional approach used by Huntington and others is to look at the officer corps of all the services as a single unit. Huntington states that the officer corps forms a profession, whose expertise is the management of violence. This expertise is shared by officers, whether in the land, sea, or air forces, as

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<sup>32</sup> Abbott 59.

<sup>33</sup> When discussing technology's affect on jurisdiction, Abbott writes: "New technological jurisdictions are therefore usually absorbed by existing professions with their strong organizations. Yet not always. The technology of airplanes revolutionized the tasks of war. Yet the air arm of the American military became separate from the Army only after an internal battle of several decades; and it lost a similar fight with the Navy." See Abbott 92. Also see note 13, p. 344.

is the sense of corporateness and social responsibility. Abbott, however, opens the possibility of acknowledging that the equipment, training and doctrine differ greatly from service to service, which results in different perspectives on war and how to wage it. Each service has its own sense of corporateness with its own uniforms, traditions, education system, bases, etc.<sup>34</sup> Although there is a joint, Department of Defense umbrella over all the services, it does make sense to use Abbott's work on competition between professions to explore differences between the services. After all, they are in competition for funding, recruits, status, and perspectives on how best to defend the nation. The services have specific competencies or missions, which are essentially jurisdictions that they try to monopolize. Consequently, this study starts with the assumption that the officer corps of the US Air Force is a profession in its own right.

Abbott uses "the very loose definition that professions are exclusive occupational groups applying somewhat abstract knowledge to particular cases."<sup>35</sup> The term *abstract knowledge* mirrors Huntington's concept of professional knowledge. The skill required of a professional is more than a simple physical ability or a routinized process. It involves thinking and applying the professional knowledge to new situations. A surgeon requires some hand-eye coordination, but what makes medicine a profession is the ability to use medical knowledge and skills in reaching a diagnosis and treating the patient, and modifying the diagnosis or treatment if needed. As the use

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<sup>34</sup> The speed at which each service has discarded the common battle-dress uniform under the guise of post 9-11 operational requirements is an indication of a potential services retrenchment against "jointness."

<sup>35</sup> Abbott 8.



computer-assisted lasers and robotics increases, the doctor's knowledge and skill are still recognized as what merits professional status. Therefore, in Huntington's terms, Abbott includes *corporateness* and *expertise* in his definition, but he completely excludes ideas of social *responsibility*. He ignores *responsibility* because by making the work his emphasis, occupations such as the auto mechanic and the medical doctor turn out to be quite similar at a certain level of abstraction in terms of diagnosing, inferring, and treating a problem. Most people would reject the comparison's implication that mechanics are a profession with the same status of medical doctors. They would quickly run through a structure similar to Huntington's and point out that mechanics lack a broad based education, have a minimal sense of corporateness, and no social responsibility. The counters are that a doctor's broad-based education does not contribute to most diagnoses, and that the medical corporateness has been used to create the illusion of social responsibility in the doctor's case. The doctor has professional status partly because traditional professions are associated with higher socio-economic levels of society. As Abbott and many others who study professions point out, there is a darker version of profession. That is, it can be argued that: 1) Professions actually define social needs that match their services; 2) The leadership of a professional organization can dominate the membership instead of relying on a collegial organizational style; and 3) Professions essentially create economic monopolies over specific services that tend to be beyond state or market controls.<sup>36</sup>

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<sup>36</sup> Abbott cites works by Terence Johnson, Eliot Freidson and Jeffrey Berlant supporting these positions.

On the other hand, part of the perception of what makes an occupation a profession rests on the ability of the profession to abstract its knowledge systems to levels beyond routine cases or skills tied to specific tasks, technologies or organizational structures. The ability to abstract tasks and knowledge to such levels and to apply it to new situations or to define old problems in new ways may well have some basis in a person's education, training, or experience. As Abbott writes, abstraction enables a profession to survive and compete.<sup>37</sup> Society will not grant professional status to an occupation that does not involve some use of abstract and esoteric knowledge and thinking. If the task is so simple that anyone can do it, it is not a profession. To Abbott, a profession requires the skills of diagnosis, inference and treatment in its work.

*Diagnosis* and *treatment* basically concern the input and output of information, but *inference* is the skill that makes an occupational group a profession. Inference "relates professional knowledge, client characteristics and chance in ways that are often obscure."<sup>38</sup> In addition, non-abstract knowledge runs the risk of becoming useless in the face of new technology or restructuring. Such is the case of the Air Force and airplanes. Flying airplanes is not a particularly abstract task in and of itself.<sup>39</sup> Abstraction is also critical because it is the basis for finding, creating, or taking over jurisdiction. Consequently, the issue of occupation versus profession can be made without the use of the concept of responsibility. Although this provides an interesting perspective, this

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Abbott 5.

<sup>37</sup> Abbott 30.

<sup>38</sup> Abbott 48.

<sup>39</sup> This issue will be discussed in further detail in Chapter 3.

study will retain the concept of societal responsibility because it is so important to the self concept of military officers. In addition, Abbott himself cannot totally disengage from the concept.

For example, Abbott states that a profession can make a claim for jurisdiction in the legal system, before the public, and in the workplace. Legal jurisdictions tend to be most permanent, but usually follow public acceptance of a profession's jurisdictions.

A jurisdictional claim made before the public is generally a claim for the legitimate control of a particular kind of work. This control means first and foremost a right to perform the work as professionals see fit. Along with the right to perform the work as it wishes, a profession normally also claims rights to excluded other workers as deemed necessary, to dominate public definitions of the tasks concerned, and indeed to impose professional definitions of the tasks on competing professions. Public jurisdiction, in short, is a claim of both social and cultural authority.

Authority often confers obligation.<sup>40</sup>

Interestingly enough, Abbott downplays the sense of obligation in the traditional American professions like medicine and law. In fact, he writes that the sense of obligation is much greater in the more heavily government-regulated continental European professions. However, he places the American military profession in the same category as these continental European professions.<sup>41</sup> Consequently, the military professions have contracted the acceptance of their jurisdictional claims in return for the obligation to defend society. Huntington's concept of *responsibility* prevails.

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<sup>40</sup> Abbott 60.

<sup>41</sup> Abbott 6.



Abbott also points out that the concept of professions can become twisted in the workplace. If a professional is incompetent, or there is too much professional work in an organization, the organizational imperative may require a nonprofessional to pick up the slack. "Workplace assimilation" occurs when nonprofessionals pick up an abridged version of the profession's knowledge system through on-the-job experience or training. Abbott refers to mental hospitals, jails and criminal courts as examples and implies that assimilation occurs more readily where elite professionals do not operate. However, the military is a better example of workplace assimilation, especially with the overlap of senior non-commissioned officers and junior officers. In fact, the case can be made that non-commissioned officers are part of the profession.<sup>42</sup> However, this study is limited to officers.

Finally, Abbott points out that professions often set high barriers to entry, requiring extensive education and exams for example. This tends to keep the profession small in terms of numbers of members, but higher in terms of quality standards. In addition, it keeps the profession monopolistic. However, such professions run into problems if demand for the professional work rises and cannot be met. If a profession cannot meet the demand, it may lose its jurisdiction. In such a profession, however, the only ways to increase output are to lower the entry standards or let subordinate professions grow to take up the slack. However, Abbott cautions that this has only been

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<sup>42</sup> The Air Force's use of enlisted weapons controllers to perform the same job as junior officers and the entire Aviation Cadet program are two examples that indicate that the distinction between officers and non-commissioned officers is quite gray. However, this study is limited to officers.

successful in the medical arena. In most other cases, the profession does not adapt or cannot quickly modify its requirements, so other professions or formerly subordinate professions jump into the void and win jurisdiction.<sup>43</sup> The Army Air Corps' heavy reliance on the Aviation Cadet Program is arguably a successful case of lowering entry standards to increase output, and the Air Force's eventual independence from the Army could be portrayed as a case of a subordinate profession growing to take up the slack. In addition, the increased percentage of non-pilot Air Force officers and general officers could also be portrayed by the heroic warrior as the lowering of Air Force officer corps entry standards in order to meet increased demand for its professional work.

As a final note, it is important to emphasize that jurisdiction is not the same as expertise. Expertise is the knowledge base and skills that the profession considers the basis for what work it can perform. Jurisdiction is the realm that society, as in the public at large or the government through regulation, accords a profession. A profession can have a monopoly jurisdiction, or share its jurisdiction along any number of means. For example, the Air Force officer corps considers itself to have an expertise in the conduct of war from manned aircraft. However, it does not have an exclusive jurisdiction in this field, since the officer corps of the Navy, Marine Corps and Army each possess the same expertise to varying degrees. Each has some jurisdiction in this line of work, both in the public's mind and in a series of inter-service agreements. In the case of the various military officer corps, expertise tends to be is what the members

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<sup>43</sup> Abbott 84.

of the profession think they can or could do, whereas jurisdiction tends to be what they are allowed to do.

In the end, Abbott's concept of focusing on the task or work that professions do to unveil jurisdictional struggles between professions is a very useful addition to the model on Air Force officership as a profession. The completed descriptive model is shown in the figure below. The dark blue arrow indicates the struggle between the Air Force officer corps and outside groups for jurisdiction in areas that the officer corps believes it has or wants to have expertise or jurisdiction. In areas that the officer corps believes that it has expertise, but no jurisdiction, it is seeking jurisdiction or attempting to create public awareness that a new jurisdiction has been created that the Air Force officer corps should fill. If the officer corps already has jurisdiction in an area, it must defend that claim against competitors. For simplicity, the diagram does not show the outside groups, but they would be represented as other spheres in a three-dimensional space. Like soap bubbles, as the professions compete, the personnel and missions at the peripheries may become entwined, and the dominant may totally absorb the other profession. Conversely, as was the case with the Air Force officer corps, a bubble might develop within an existing profession's bubble, and then pop off, forming its own bubble. It is also possible for the bubbles to remain intact and share a jurisdiction or for a new profession's bubble to seemingly pop out of nowhere, i.e., to come from a non-profession, with personnel and expertise to fill a new jurisdiction.



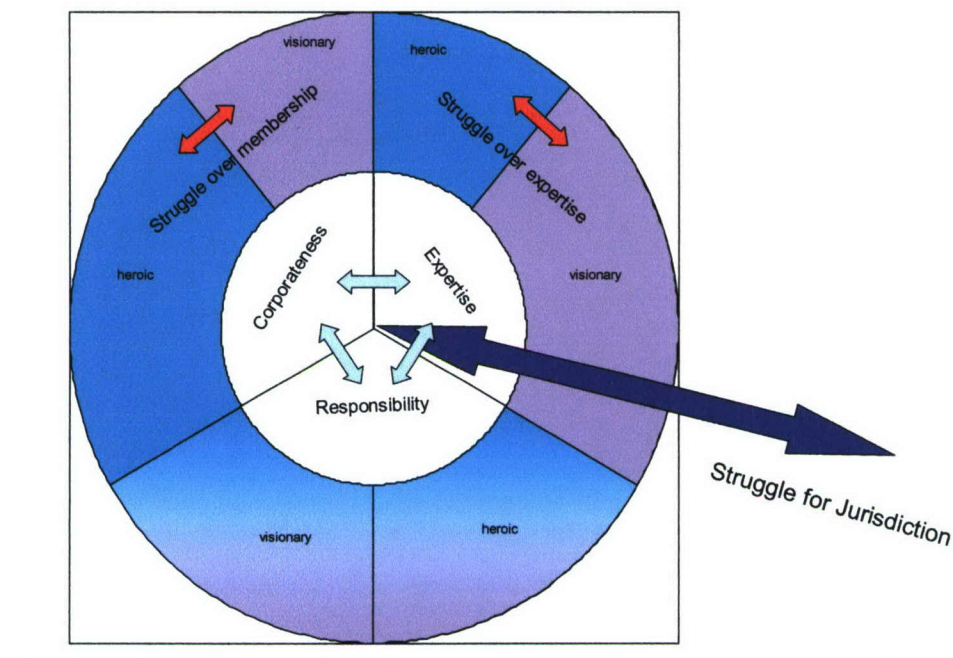


Figure 2-4: Completed Descriptive Model, Incorporating Abbott

### Summary

This chapter has culled ideas from the writings of Samuel Huntington, Morris Janowitz and Andrew Abbott in order to develop a descriptive model of profession for use in the rest of this study on the Air Force officer corps. The descriptive model of profession is shown in the figure above. The basis of the model is a transformation of Huntington's static three pillars of a profession into a more dynamic setting, in which expertise, corporateness and responsibility interact within the profession. The basic circular shape represents the profession. The three pie pieces represent expertise, corporateness and responsibility, and the light blue arrows symbolize the interaction between these concepts. The next layer of the model is based on an adaptation of

Janowitz' heroic leader and military manager archetypes. The outer ring depicts the two new archetypes of heroic warrior (teal blue) and visionary warrior (purple), broken out into each of the pie pieces. The red arrows in the outer ring indicate the tension between the heroic warrior and visionary warrior archetypes in the areas of expertise and corporateness. Expertise tends to be somewhat dominated by the visionary warrior archetype, and the concept of corporateness is more heavily dominated by the heroic archetype. Responsibility is depicted as being equal between the archetypes since both feel the obligation in similar terms. The final piece of the model comes from Abbott's concept of focusing on the task or work that professions do to unveil jurisdictional struggles between professions. The dark blue arrow indicates the struggle between the Air Force officer corps and outside groups for jurisdiction in areas that the officer corps believes it has or wants expertise or jurisdiction.

One can then take this two-dimensional drawing and visualize it as a sphere floating in space with other spheres, each representing a profession or grouping of people. The spheres may stay intact as they compete and each may be awarded a share of a jurisdiction. However, other outcomes are also possible. Like soap bubbles, as the professions compete, the personnel and missions at the peripheries may become entwined, and the dominant may totally absorb the other profession and monopolize the new jurisdiction. Conversely, as was the case with the Air Force officer corps, a bubble might develop within an existing profession's bubble and then pop off, forming its own bubble and dominate a new jurisdiction. It is also theoretically possible for a new

profession's bubble to seemingly pop out of nowhere (from a non-profession, for example) with personnel and expertise to fill a new jurisdiction.

This descriptive model provides a synthesis of several ideas on profession. It also acts as a definition of profession for this study and provides some boundaries and focus for the rest of the manuscript. Since in the descriptive model developed in this chapter the profession is symbolized by a circle, one might conceivably start anywhere on that circle. However, a basic assumption is that the pillar of responsibility is not contested between the heroic and visionary warrior archetypes. Both claim that their perspectives better meet the officer corps' obligations to society, but neither contests the basic concept or disagrees on its interpretation. Corporateness might be a place to start. One might even be tempted to argue that corporateness determines expertise, but that runs counter to the argument advanced in this manuscript. First of all, it would appear to be an argument based on bureaucratic politics or organizational politics perspectives since it paints the picture of an organization looking for a justification to keep itself intact. More important, it is clear from my original statement of the puzzle that four-star and other general officer pilots have been in charge of the officer corps as the percentage of pilot officers and pilot general officers have both declined; so pilots are purposely reducing the pilot weighting within the officer corps' composition. This is not being done in a vacuum. If the decline was one of raw pilot numbers, it could be tied to the availability of aircraft. However, since it is a decline in the percentages of pilots, the officer corps is purposely shifting the weighting between different career



fields. Other areas of expertise within the officer corps have increasing percentages of the total membership. Consequently, rather than start with corporateness, the most important issue to address up front is the fundamental question of what is the Air Force officer corps' expertise. The next chapter examines the core question of what exactly is the Air Force officer corps' expertise—is it flying or something else, which Carl von Clausewitz described as military *genius*? That will be followed by a look at expertise and technology, before moving on to the issue of the Air Force officer corps' sense of corporateness.

### **Chapter 3: Air Force Officer Corps Expertise: Military Flying or *Military Genius*?**

#### Introduction

Expertise is important because of the role it plays in defining a profession. As Huntington writes, a professional has expert intellectual knowledge within a significant field of human endeavor. This distinguishes the professional from the tradesman, whose hallmark is the mastery of existing technique without intellectual knowledge. Expertise also plays a role in defining differences between professions, and it provides a basis for a profession's jurisdictional claims. This is particularly important in the case of the Air Force officer corps because the division of the military services into operational mediums (air, water, ground) supports both the Air Force's organizational culture and the public's perception that the Air Force officer corps' expertise is flying. This is problematic from a definitional point of view for a variety of reasons. First of all, it is not clear that flying is indeed a skill befitting of a profession. Second, there are vast numbers of flying schools, airlines, charter airlines, air cargo companies, and private aircraft and pilots in the United States and throughout the world that do the same type of work. Even in the combat flying realm, the Navy, Marine Corps and Army all have partial jurisdictions; so the Air Force officer corps must face constant competition just to maintain its slice within the jurisdiction of combat flying. Third, as the percentage of pilot officers decreased, the percentage of officers serving in other career fields within the officer corps increased; so the officer corps appears to be shifting its

weight of emphasis between areas of expertise. Fourth, systems in development since World War II such as intercontinental ballistic missiles, surface-to-air missiles, unmanned combat aerial vehicles for example, are increasingly encroaching on the realm of manned-flight in combat. Work based solely on manned combat aircraft runs the risk of obsolescence. Finally, it is possible that flying is an important trade skill that supports a larger expertise. For example, in the Army driving a tank might be considered an important trade skill supporting a larger expertise in armored warfare, which in turn is a subset of a larger expertise in land warfare. Flying, whether in fighter, bomber, or tanker aircraft, for example, might then be an important trade skill supporting a broader expertise in aerial warfare. However, even this formulation might sell the Air Force officer corps short since a medium-based division of jurisdiction between the services leaves plenty of room for competition at the seams, as for example in the case of close-air-support, which involves both air and ground forces.

Furthermore, there would appear to be jurisdictional competition to fill the voids in mediums like the radio-electronic ether, space, and information. Consequently, it is important to understand exactly what the defining expertise of the Air Force officer corps is in order to understand its place in the system of jurisdictional competition.

This chapter is the first of four dealing with different aspects of the Air Force officer corps' expertise. It provides a transition between the descriptive model in the previous chapter and the introduction of Air Force data on its missions in the following chapter by examining what the Air Force officer corps' expertise should be from a



theoretical perspective. This is done through an examination of ideas on the expertise of the profession of officership offered by Carl von Clausewitz, Samuel Huntington, and Giulio Douhet. Von Clausewitz' On War forms the foundation for all studies on officership in the modern era. Huntington's descriptions of the officer corps' expertise, which were briefly covered in the preceding chapter, require further study, and Giulio Douhet is one of the original airpower theorists. All three are important analysts of the military profession, and all three similarly conclude that the expertise of the profession of military officership has much more to do with the ability to process incomplete information and make higher-level decisions under the stresses of combat than it does with specific technical skills like firing a weapon or flying an airplane. Von Clausewitz makes the most compelling argument, but also the most abstract. Furthermore, since he predates aircraft, he obviously does not discuss airpower or provide air force examples. However, von Clausewitz does give a name to the concept of officer expertise in decision-making, which he called *military genius*. Huntington is more concrete than von Clausewitz. In addition, the independent Air Force was a decade old when Huntington's The Soldier and the State was published. However, Huntington's definitions and examples of the expertise of the military officer raise the possibility that large numbers of the Air Force officer corps are not really military professionals. Finally, Douhet, the ardent Italian champion of air forces as an independent, co-equal branch of service, indicates that flying, designing and maintaining aircraft are all technical specialist skills. Consequently, he seems to be limiting the validity of the

jurisdictional claims by the independent air force officer corps since the expertise of flying, maintaining and creating aircraft is shared with civilian groups. However, by downplaying the technical skills of flying, maintaining and designing aircraft, Douhet opens the door for revolutionizing warfare through airpower, which is a much higher, more abstract expertise and claim for jurisdiction. Consequently, my conclusion is that the Air Force officer corps' real expertise lies within the realm that von Clausewitz calls *military genius*. The chapter concludes with a brief look at reasons for why the perception exists that the Air Force officer corps is all about flying. Those reasons will be looked at in detail in later chapters.

#### von Clausewitz

The Prussian general Carl von Clausewitz' work On War is frequently cited in discussions of officership as a profession. He is generally accorded importance because he was both a thinker and a practitioner, whose work goes far beyond mere discussions of tactics or campaign histories. For example, he examines what war really is, and what qualities and characteristics great commanders must possess. His personal experience and a major source of the examples he uses to illustrate points come from the Napoleonic era, which is generally regarded as the beginning of the modern era of European warfare. Finally, many of von Clausewitz' higher level tenets are quite profound and still applicable today.

Von Clausewitz is also important in this study because many of Abbott's concepts can be seen in von Clausewitz' writings. Prussia switched from an aristocrat-

based officer corps to a merit-based system incorporating non-aristocrats during the Napoleonic wars because the old system proved inadequate on the battlefield. The officer corps profession failed to meet its obligation to defend the nation and consequently faced a potential loss of jurisdiction. However, since there were no competing professions, and the government obviously wanted to maintain the state's monopoly over armed groups in society, the available option was not to withdraw jurisdiction, but to demand change or reform so that the profession could meet its responsibility. The new system, with a new sense of corporateness (inclusion of officers of middle-class origins and merit-based recruitment and promotions) and a new expertise (improved officer training) proved much more effective in the field, but the change was not without controversy.<sup>44</sup> Victory on the battlefield was critical in the re-affirmation of the contract between society, represented by the government, and the officer corps. In addition, von Clausewitz' book served to advance the public relations work upon which jurisdiction rests. After much soul searching, von Clausewitz purposely decided to direct his writings towards a wider audience than simply military

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<sup>44</sup> Officers of middle class origins were quickly inducted into the Army, but as Janowitz points out, nobles continued to dominate the general officer ranks through World War I. This is a parallel trend between the rise of middle class officers in the Prussian Army to general ranks and the non-rated officers in the Air Force. Janowitz reports that in 1824 42% of the total officers were of middle class origins, but only 3% of the generals. In 1872 middle class officers accounted for 51% of the total officers, but only 6% of the generals. In 1898, officers of middle class origins made up 60% of the officer corps, but only 19% of the generals. In 1911, the numbers rose to 60% of the officer corps and 33% of the generals. See Janowitz 94. The profession's responsibility to society could at least partly explain the aristocratic leadership's acceptance of the reforms and gradual movement of more officers of middle class origins into the general officer ranks.



officers.<sup>45</sup> As Abbott advises, von Clausewitz strikes a good balance between practical, straightforward thoughts and abstract knowledge. The non-professional reader understands enough to gain a general appreciation of officership. The reader realizes that officership is complex and abstract enough to deserve the status of a profession, yet not so abstract that it appears worthless.

Of course, von Clausewitz is also important in his own right for this study. First of all, his underlying premise is that officership is a profession. Furthermore, von Clausewitz argues that two major factors come together in the truly great military leaders whose reputation stands the test of time. The first is their natural dispositions, which have endowed them with characteristics that are important in the profession. The second is the combination of education, training, experience and practice in things military. Hence, the skills are at least partly learnable. In addition, von Clausewitz provides a definition of war that both places the officer corps in the constellation between the government and the people, and explains the expertise required of officers.

Von Clausewitz begins on a somewhat abstract level with the issue of expertise. The expertise of the military profession is war; so von Clausewitz logically starts with the question of what is war. Von Clausewitz labored long and hard over the issue before settling on this description:

As a total phenomenon, its dominant tendencies always make war a paradoxical trinity—composed of primordial violence, hatred, and chance and probability,

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<sup>45</sup> Carl von Clausewitz, *On War*, ed. and trans. Michael Howard and Peter Paret, (Princeton: Princeton UP, 1989) 63.

within which the creative spirit is free to roam; and of its element of subordination, as an instrument of policy, which makes it the subject of reason alone.

The first of these three aspects mainly concerns the people; the second the commander and his army; the third the government.<sup>46</sup>

At first glance it is often difficult to see the elements of the *trinity* in the first, somewhat complicated sentence. Furthermore, it is not immediately evident what “chance and probability, within which the creative spirit is free to roam” has to do with officership. What is von Clausewitz talking about? First of all, von Clausewitz is capturing the essence of modern European warfare—the return of man to the battlefield—which was a byproduct of the French Revolution.<sup>47</sup> Citizen-soldiers brought different motivations and expectations to war than impressed soldiers. Among other things, citizen-soldiers brought passion, education or experience in other fields, and the need to expand the officer corps to lead the vastly larger armies. The demands placed on officers were changing, and so was the officer corps itself. It was shifting from the duty or place of aristocrats to a profession. The new officer corps’ jurisdiction was located between the government and the citizen-soldiers. The government sets political goals through the use of reason and military force may be required to achieve those goals. The citizen-soldiers, the people, receive rudimentary training in basic soldiering skills and confront the mixture of fear, excitement, and violence in battle. An officer must capture and

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<sup>46</sup> Von Clausewitz 89.

<sup>47</sup> As Austria and Prussia intervened against the Revolution, they expected a campaign along the lines of the very limited, 18th century concepts of war and foresaw an easy victory over the weak French army. However, the *levée en masse* unleashed a powerful and unexpected force: “Suddenly war again became the business of the people—a people of thirty millions, all of whom considered themselves to be citizens.” Von Clausewitz 591-592.

keep alive the passion of the citizen-soldiers, understand the end goal that the government seeks, and use his experience, knowledge and training to achieve that goal with the citizen-soldiers in battle. Throughout it all, the officers must deal with uncertainty as well as with their own internal struggles between passion and reason. With education, predisposed officers can revel in the uncertainty of war and in fact serve as a counterbalance to it: "With uncertainty in one scale, courage and self-confidence must be thrown into the other to correct the balance. The greater they are, the greater the margin that can be left for accidents."<sup>48</sup> And *accidents*, or unexpected events, will always occur in war.

War, being fought between opposing groups of men, is susceptible to miscommunication, changes in weather, and a host of other factors that von Clausewitz describes as "the realm of probability and chance," or the battlefield.<sup>49</sup> This is the realm of *fog*, the environment created by the profusion of lies, half-truths, and truthful information that a commander must sort through to make decisions, with never enough reliable information. It is also the realm of *friction*, a Murphy's law of sorts, where orders do not get delivered correctly, plans are misunderstood, not implemented as imagined, or turn out to be impossible to implement. It is also the realm where an officer's character and intellect is critical. Freed by the chaos of the moment from the mental chains that often limit his vision and "box" in his range of potential solutions,

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<sup>48</sup> Von Clausewitz 86.

<sup>49</sup> Von Clausewitz 89.



his priority becomes accomplishing the task in both a timely manner and in a way that contributes toward the higher level goals. This is the second part of the trinity, that of "chance and probability, within which the creative spirit is free to roam." This is the domain, the jurisdiction, of the officer corps.

Von Clausewitz is saying that the officer's expertise is a combination of decision-making, management and leadership in a peculiar, extremely stress-filled environment. Consequently, von Clausewitz portrays the expertise in terms of characteristics that build to this expertise. He dedicated an entire chapter to what he called *military genius*, by which he was using the term *genius* to mean "a very highly developed mental aptitude for a particular occupation."<sup>50</sup> Von Clausewitz leads the reader through a survey of characteristics that make up this aptitude:

What we must do is to survey all those gifts of mind and temperament that in combination bear on military activity. These, taken together, constitute *the essence of military genius*. We have said *in combination*, since it is precisely the essence of military genius that it does not consist in a single appropriate gift—courage, for example—while other qualities of mind or temperament are wanting or are not suited to war. Genius consists in *a harmonious combination of elements*, in which one or the other ability may predominate, but none may be in conflict with the rest.<sup>51</sup>

Von Clausewitz follows with further details. "War is the realm of danger; therefore *courage* is the soldier's first requirement."<sup>52</sup> Here von Clausewitz is concerned with "courage in the face of personal danger," which involves both "an

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<sup>50</sup> Von Clausewitz 100.

<sup>51</sup> Von Clausewitz 100.

<sup>52</sup> Von Clausewitz 101.

indifference to danger,” which may be natural or learned, and an emotion generated for short periods from “such positive motives as ambition, patriotism, or enthusiasm of any kind.”<sup>53</sup> A soldier must also, through natural disposition or training, become indifferent to physical exertion and suffering. Then, von Clausewitz moves on to the powers of the intellect. “War is the realm of uncertainty; three quarters of the factors on which action in war is based are wrapped in a fog of greater or lesser uncertainty. A sensitive and discriminating judgment is called for; a skilled intelligence to scent out the truth.”<sup>54</sup>

Furthermore:

If the mind is to emerge unscathed from this relentless struggle with the unforeseen, two qualities are indispensable: *first, an intellect that, even in the darkest hour, retains some glimmerings of the inner light which leads to truth; and second, the courage to follow this faint light wherever it may lead.* The first of these qualities is described by the French term, *coup d’oeil*; the second is *determination*. ... *Coup d’oeil* ... merely refers to the quick recognition of a truth that the mind would ordinarily miss or would perceive only after long study and reflection.

Determination in a single instance is an expression of courage; ... But here we are referring not to physical courage but to the courage to accept responsibility, courage in the face of moral danger. ...the role of determination is to limit the agonies of doubt and the perils of hesitation when motives for action are inadequate.<sup>55</sup>

Von Clausewitz emphasizes that the good officer must have both intellect and courage. Although one can skip the agonizing over a decision by making it quickly, a rash decision will more often than not be wrong. The other extreme of thinking without acting, i.e., indecision, is also bad. The strength of mind (not intelligence) that von

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<sup>53</sup> Von Clausewitz 101.

<sup>54</sup> Von Clausewitz 101.

<sup>55</sup> Von Clausewitz 102-103 (italics in original).

Clausewitz discusses requires the officer to be able to think and to make decisions in the face of uncertainty and chance. A strong character is not wishy-washy, but also not obstinate. A good officer analyzes a situation, makes a decision and stands by that decision until events or logic dictates a change.<sup>56</sup> Von Clausewitz also discusses *presence of mind*, which he describes as “nothing but an increased capacity of dealing with the unexpected.”<sup>57</sup> An officer must act rationally and not become upset by powerful emotions.

Von Clausewitz also delves into the importance of possessing the gift of a sense of locality, which in the modern sense would better be translated as a gift for developing and maintaining situational awareness, i.e. “things are perceived, of course, partly by the naked eye and partly by the mind, which fills the gaps with guesswork based on learning and experience, and thus constructs a whole out of the fragments that the eye can see.”<sup>58</sup> He attributes this to “imagination,” by which he means the ability “to combine details into a clear, coherent image,” and maintains that this skill can be trained and improved through practice, which is important since as the officer climbs in seniority, he must be able to maintain situational awareness over larger areas and time periods.<sup>59</sup>

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<sup>56</sup> Von Clausewitz 105-109.

<sup>57</sup> Von Clausewitz 103.

<sup>58</sup> Von Clausewitz 109.

<sup>59</sup> Von Clausewitz 110.



Von Clausewitz sums it all with the following:

With this, we believe, we have reached the end of our review of the intellectual and moral powers that human nature needs to draw upon in war. The vital contribution of intelligence is clear throughout. No wonder then, that war, though it may appear to be uncomplicated, cannot be waged with distinction except by men of outstanding intellect.<sup>60</sup>

Von Clausewitz frequently reminds the reader that each officer's individual character and intellect are different, and that "no case is more common than that of the officer whose energy declines as he rises in rank and fills positions that are beyond his abilities."<sup>61</sup> At the same time, "even junior positions of command require outstanding intellectual qualities."<sup>62</sup> Von Clausewitz concludes the chapter on military genius with the following observation:

If we then ask what sort of mind is likeliest to display the qualities of military genius, experience and observation will both tell us that it is the inquiring rather than the creative mind, the comprehensive rather than the specialized approach, the calm rather than the excitable head to which in war we would choose to entrust the fate of our brothers and children, and the safety and honor of our country."<sup>63</sup>

The Air Force officer corps tends to shy away from von Clausewitz' level of abstraction. The history of the Air Force and its struggle for independence is tied to aircraft, airpower, and strategic bombing. Culturally, there seems to be no desire to abstract to a level that leaves aircraft out. In fact, it might be dangerous to loosen that connection too much. Nevertheless, both the heroic and the visionary warrior

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<sup>60</sup> Von Clausewitz 110.

<sup>61</sup> Von Clausewitz 110.

<sup>62</sup> Von Clausewitz 111.

<sup>63</sup> Von Clausewitz 112.

archetypes can find something to support their positions in von Clausewitz. To the heroic warrior, the parallels between von Clausewitz' discussion and *the right stuff* are clear. As Tom Wolfe described it, *the right stuff* is: "That a man should have the ability to go up in a hurtling piece of machinery and put his hide on the line and then have the moxie, the reflexes, the experience, the coolness, to pull it back in the last yawning moment—and then to go up again *the next day*." This described flying life in the 1950s when Navy pilots had a 23% probability of dying in an aircraft accident and a 56% probability of ejecting once during their career.<sup>64</sup> From this perspective, a successful pilot is attributed to have the *right stuff*, to face danger with a cool head, and for whatever reason, to consistently make the right choice in life or death situations. Although accident and even combat death rates have shrunk dramatically to the point of being inconsequential, flying (piloting) is still perceived to be a complicated business that only the select few can handle.<sup>65</sup> To the heroic warrior, that is precisely what von Clausewitz is talking about. Furthermore, since successful pilots have *the right stuff* by definition, they are obviously the most competent in terms of expertise and consequently, those most qualified to rise to positions of leadership within the officer corps.

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<sup>64</sup> Tom Wolfe, *The Right Stuff*, (New York: Farrar, Straus, Giroux, 1979) 22, 24.

<sup>65</sup> For example, from 1977 to 2001, USAF fatal mishaps have decreased from 1.2 per 100,000 flying hours to 0.4. USAF aircraft destroyed have decreased from 2.5 per 100,000 flying hours down to 1.0. The general trends are steady decreases. The fatal mishap rate was 0.3 in 1991, the year of Desert Storm, and as low as 0.2 in 1999. Assistant Secretary of the Air Force (Financial Management and Comptroller of the Air Force), Deputy Assistant Secretary (Cost and Economics), *United States Air Force Statistical Digest Fiscal Year 2001* (Washington: United States Air Force) 114.

To the visionary warrior, *the right stuff* is but one small slice of the expertise pie that von Clausewitz describes. *The right stuff* is too restrictive an analogy because it is clearly tied to one man and his machine. A good rodeo cowboy also has *the right stuff*, and his environment is in some ways more complicated since it is not man versus machine, but man versus animal, whose thoughts and feelings throw more unpredictability into the equation. People who routinely must make important decisions in stressful situations with limited information or information overloads might feel kindred spirits with both Wolfe and von Clausewitz. An emergency relief coordinator, a surgeon, a CEO, or a football quarterback might, for example, feel very familiar in this environment. The person must process information at conscious and subconscious levels to arrive at conclusions and decisions that he himself might not be able to fully explain, at least in a short amount of time. Then the person has the self-confidence to implement that decision in the face of doubt or even opposition from others, yet the openness to continue to monitor the situation and adjust, when there is a compelling reason, which may once again be at the subconscious level.

Von Clausewitz is not talking about the moxie to fly an aircraft, but the ability to plan and lead operations at higher levels. Although von Clausewitz devotes a chapter to the interplay and relationships between the three primary ground combat arms his day, the infantry, artillery, and cavalry, he never writes that one particular type of soldier is most qualified for command over all others. In all of his discussions on the genius of military officership, von Clausewitz never considers it to be a requirement for a higher



level commander to be an expert horseman, marksman or superb artilleryman. “He need not know how to manage a wagon or harness a battery horse, but he must be able to gauge how long a column will take to march a given distance under various conditions.”<sup>66</sup> From the visionary warrior perspective, competent officers would know the capabilities of their forces and take these capabilities into account in the planning, as well as in the monitoring and adjustment phases of execution. This would be true whether the forces were manned, unmanned or a combination, or whether the officer’s career specialty were pilot, air battle manager or intelligence.

Although von Clausewitz keeps coming back to the same general points of which specific mental qualities great commanders must have, he does not offer useful ways, short of trial by fire, to discover which officers most possess and have developed these qualities. Furthermore, he is clear that success at a lower level is not a guarantee of further success at higher levels. “No great commander was ever a man of limited intellect. But there are numerous cases of men who served with the greatest distinction in the lower ranks and turned out barely mediocre in the highest commands, because their intellectual powers were inadequate.”<sup>67</sup> Herein lies the crux of the competing archetypes. Proponents of both the heroic and the visionary warrior archetypes are interested in producing officers who embody the best characteristics as described by von Clausewitz. The profession must produce such officers, particularly those who rise

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<sup>66</sup> Von Clausewitz 146.

<sup>67</sup> Von Clausewitz 146-147.

to higher levels of authority. The perspectives differ over the issues of whether pilot performance is the key determinant and predictor of such characteristics, and where exactly officers with such skills should be placed.<sup>68</sup>

### Huntington

Huntington's work on the profession of officership is often taken as the gold standard by the military, perhaps because it appears to be straightforward and easy to capture in relatively few words. However, a deeper examination of his work yields many problems, particularly with respect to applying his definitions and examples to the Air Force. For example, his definition of expertise requires professional knowledge "in a significant field of human endeavor." In addition, that knowledge is intellectual in nature and acquired through long study of the liberal arts as well as profession-specific material. Furthermore, familiarity with the profession's history is necessary to use the professional knowledge. These requirements, however, are somewhat problematic for the Air Force since it is not quite clear exactly where piloting aircraft and other Air Force specialties fall in his definition. For example, flying may not be a significant field of human endeavor. We do not credit driving a bicycle, car or boat with this status in contemporary society, although there were times when each of these was seen as a somewhat exotic skill. Flying an airplane also does not seem to require a liberal arts

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<sup>68</sup> This formulation of course raises a few more questions. If for example, pilot skill was the key predictor of a great decision-making leader, then would it not be in the Air Force's interest to make every officer learn to fly as an evaluation test? Similarly, once an officer shows possession of the right characteristics, might it not make sense to ground the officer and place the officer in a battle-management staff or command position?

education or an understanding of the occupation's roots. In fact, the aviation cadet program, whose graduates provided the Air Service, Air Corps, and Air Force with pilot officers for roughly 40 years, was based on the idea that a college degree was not a prerequisite for becoming a pilot or an officer.<sup>69</sup> When Huntington published The Soldier and the State in 1957, over half of the Air Force's officers did not have a bachelor's degree. Even in the general officer ranks, bachelor's degrees were not automatic. Chart 3-1 (GO Samples: Total Line General Officer Initial Education Level by Percent) shows that as late as the 1993 line general officer sample, serving general officers had initially joined the Air Force without a bachelor's degree. Furthermore, almost 50% of the 1973 line general officers sampled entered the Air Force without college degrees. In addition, for those entering with college degrees, Chart 3-2 (GO Samples: Total Line General Officer Initial Education Major by Percent) indicates that among the line general officers sampled, there has been a clear preference historically for degrees in math, engineering and sciences, not liberal arts. Consequently, the Air Force officer corps seems to stand in opposition to some of Huntington's basics on profession.

Since Huntington was trying to get his arms around officers in all services, he skirted the issue of where specific career fields fit into the scope of profession through abstraction. He declared that the military officer's expertise was best summed up by

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<sup>69</sup> By "aviation cadet program" I mean both the Aviation Cadet Program itself as well as its precursors, in which enlisted men or civilians were trained to be pilots (and sometimes observers or navigators) first, and usually given officer commissions upon completion of flight training.



Chart 3-1: GO Samples: Total Line General Officer Initial Education Level by Percent

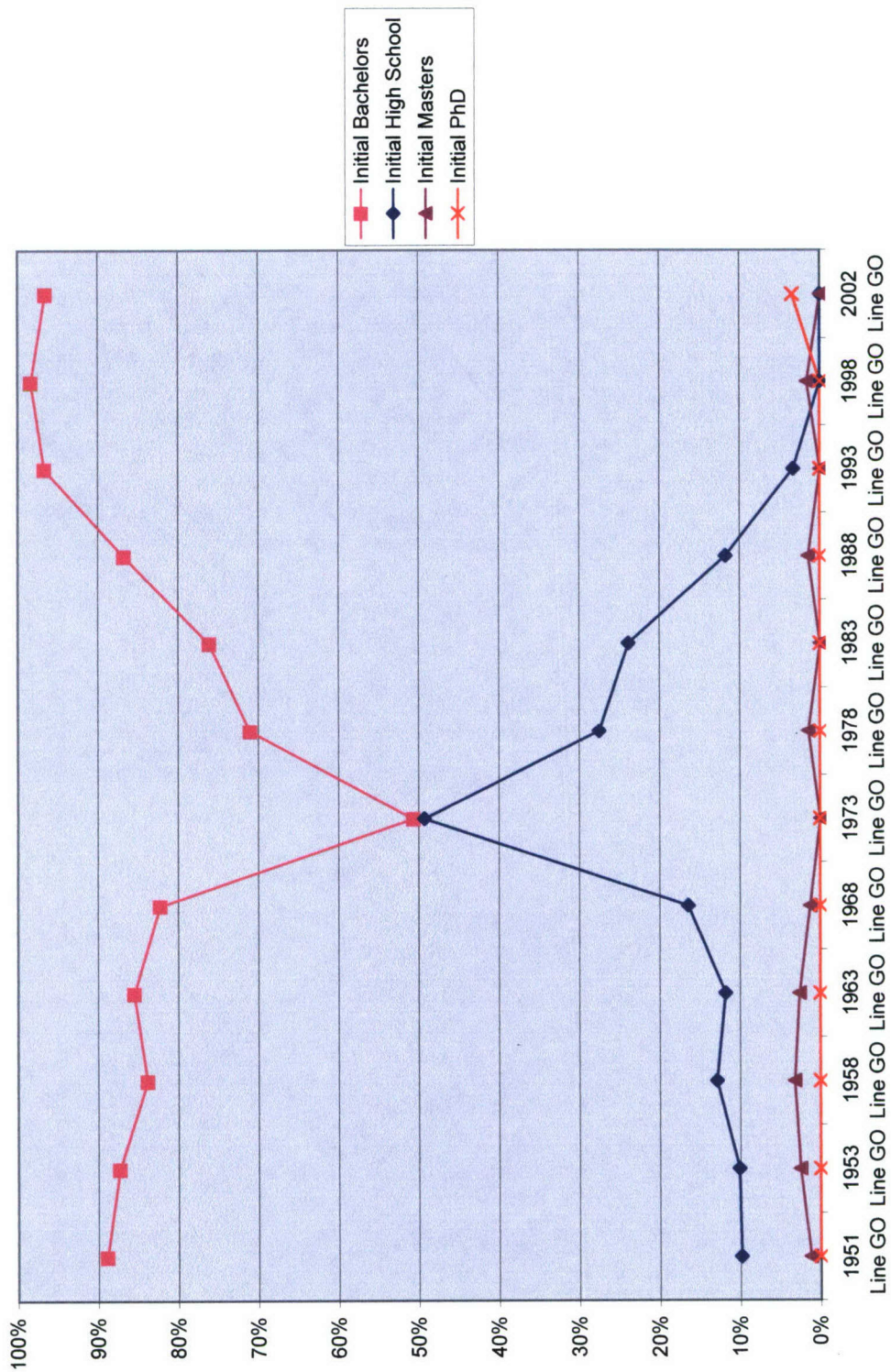
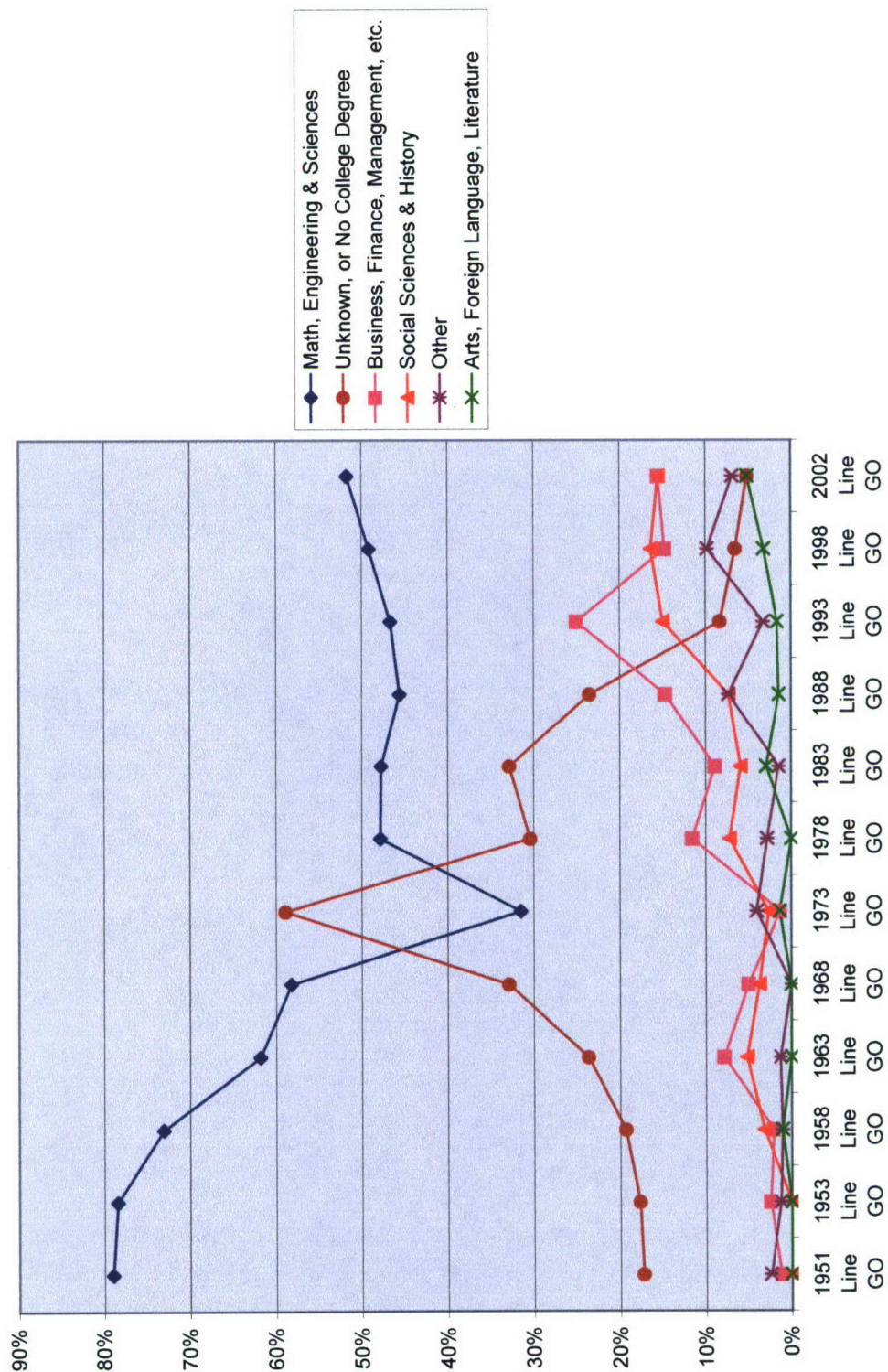


Chart 3-2: GO Samples: Total Line General Officer Initial Education Major by Percent





Harold Lasswell's phrase: "The management of violence."<sup>70</sup> Huntington further defines the officer's tasks to be:

1) The organizing, equipping and training of this [military] force; 2) the planning of its activities; and 3) the direction of its operation in and out of combat. The direction, operation, and control of a human organization whose primary function is the application of violence is the peculiar skill of the officer.<sup>71</sup>

Huntington is also not clear whether an officer must demonstrate competency simultaneously in all three of the tasks Huntington defines, have demonstrated competency in all three areas over the course of his career, or, most likely, simply have the potential to competently fulfill these tasks at any time in his career. Obviously, the more senior an officer is, the more likely the officer is to be involved in all the tasks. Competency increases as the officer progresses through the ranks, but where exactly does the barest minimum level of competence lie—apparently through the simple act of commissioning. An infantry platoon leader is regarded as having minimal competency, but the commander of a joint operation at the theater level is considered to be near the top of his potential competency.<sup>72</sup> However, it is very difficult to translate Huntington's ground forces examples into the Air Force flying environment. In the ground forces, a lieutenant or captain might be meeting all of Huntington's wickets at the platoon or company level, but in the modern Air Force, even a lieutenant colonel squadron commander does not plan and direct his squadron as a unit in combat.

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<sup>70</sup> Huntington 11.

<sup>71</sup> Huntington 11.

<sup>72</sup> Huntington 12.



Huntington's definition of expertise is also problematic because it excludes large numbers of Air Force personnel from professional status. For example, in an aircraft with multiple crew positions, the aircraft commander, who is always a pilot, is responsible to "direct" the crew; so it is not clear that the other pilot, especially if he is not aircraft-commander-qualified, or navigator perform any professional officership functions above those done by the enlisted flight engineer. The copilot should eventually rise to the position of aircraft commander, but the navigator position is always subordinate to the aircraft commander. Consequently, that position might never qualify as a manager of violence—even though a navigator-bombardier is in charge of the bomb run. In fact, many officers, regardless of rank, do not have direct ties to the management of violence. Huntington admits that the modern military is made up of many specialties, many of which appear to duplicate civilian professions. He is clear that members of the officer corps who do not participate in the management of violence, such as doctors, are not part of the profession despite their officer status.<sup>73</sup> This is partly because they, along with nurses and chaplains for example, have special status under the Geneva Conventions that prohibit them from taking up arms. Huntington also excludes enlisted personnel from the profession because they are presumably not managers of violence and because they lack the requisite education.<sup>74</sup> This misses the

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<sup>73</sup> In this manuscript, all Air Force officers, line or non-line, are considered part of the profession, although the manuscript primarily addresses line officers.

<sup>74</sup> Huntington also bases part of this argument on the simple existence of the division between officers and enlisted. That is, if the military did not make such a big deal of the difference, there would not be any. I personally exclude the enlisted ranks from this study to make it more manageable, but am inclined

fact that there is overlap in many cases between noncommissioned officers and junior commissioned officers in terms of responsibility, professional knowledge, the management of violence, and historically even in education levels.

Even more disturbing from a cultural point of view is the fact that Huntington's definition might actually imply that other career fields such as air battle managers have professional status, but many pilots do not. Take the case of a flight of two fighter-interceptors, under the control of an air battle manager, intercepting an unknown aircraft. It would appear that the air battle manager is exhibiting professional officership since he is directing the operation of the military force (the flight) in potential combat. Furthermore, although the air battle manager has not organized or equipped the flight, he may have helped train the pilots on intercept missions. The flight leader may be exhibiting both rifleman (trade) and leadership (professional) skills since he is under the air battle manager's control for the intercept, but simultaneously in command of the wingman and responsible for completing the intercept. The wingman appears to be the equivalent of the rifleman. Furthermore, because of Huntington's emphasis on combat, transport pilots might also be excluded from professional status, as

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to include at least non-commissioned officers as part of the profession. Furthermore, I question the validity of assigning the same work to both officers and noncommissioned officers as is done with weapons controllers and junior air battle managers when only the officers currently are accorded professional status.



might a variety of other service specialties such as acquisitions, maintenance, communications or space operations.<sup>75</sup>

The determination of expertise is critical because of the interplay with membership in the profession. Psychologically, people who are part of a group whose tasks involve killing others prefer to categorize themselves as doing it as part of a higher calling instead of as a member of a trade, devoid of any intellectual or moral capacity. Finally, the issue of who embodies the profession, i.e., the determination of who the true managers of violence are, also determines status and prestige. It clarifies which military tasks require an officer and which do not. There should not be tasks that both officers and enlisted fulfill as a major part of their work, nor should there be tasks that both officers and civilians fulfill as a major part of their work. Such tasks could not be particularly prestigious for an officer, and it does not make economic sense to pay an officer to perform an enlisted task.

It is clear that Huntington's definitions leave a great deal of room for argument between protagonists of the heroic warrior and the visionary warrior archetypes. From the heroic warrior perspective, few career fields beyond pilots, some navigators,

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<sup>75</sup> Huntington's treatment of reserve officers is also problematic. He includes reserve officers serving on active duty as professionals, but in a limited, temporary capacity, which is restricted to their actual time of service. See Huntington 17. This is awkward since society would not accept a similar caveat for other professions. Medical doctors, for example, are not divided between full-timers at hospitals and part-timers in private practice with only full-timers having an obligation at the scene of an automobile accident or when somebody collapses at the theater. The restricted status also removes reservists from the professional tenet to devote their lives to the profession, including self-study and self-betterment to raise one's individual competence as well as the standards of the overall profession. Finally, it cuts to the heart of Huntington's argument on profession if the expertise does not require full-time devotion, the corporateness can be a part-time affair, and responsibility is only applicable when on duty.



missiliers, and security forces have any claim to being directly involved in violence. However, most pilots, while actually flying an aircraft, are in a position more representative of the rifleman, a tradesman who has mastered a technical skill, than of a manager of an organization conducting violence. The same holds true for navigators and missiliers. It is not until they climb out of the cockpit or launch control facility and into planning or command and control positions that they actually play a part in the management of violence. And when they make that transition, they are no longer heroically piloting, navigating, or launching missiles. On the battlefield, only pilots who are multi-seat aircraft commanders, flight leaders, or “package commanders,” and officers (and noncommissioned officers) who are security police combat team leaders, forward air controllers, or air battle managers actually manage, direct or lead people conducting violence. However, this ends up being a very select group, and culturally, the Air Force does not want to equate a pilot flying as a strike package commander with an air battle manager or a truck convoy commander.

Furthermore, the entire enterprise grinds to a halt if airplanes, missiles, electronic systems and people are not maintained and repaired. From a visionary warrior point of view, the command, control, communications, computer, intelligence, surveillance, and reconnaissance (C4ISR) aspects have become at least as important as the flying part in combat operations. Both the intelligence officer, recommending a target, and the Air Force lawyer, advising a commander on the legality of one target over another, are both heavily involved in the direction of violence. These links

become even more pronounced as the targeting cycle shrinks. It is no longer the somewhat abstract and detached perspective of trying to bomb the railroad yards in Berlin until sufficient damage is achieved. The question now is frequently, "Shall we use this specific weapon to destroy that car with those specific people in it right now?" This immediacy reinforces the direct connection between intelligence and killing a target. The blood is on everyone's hands; all are part of the profession.

Huntington appears to be on a track similar to von Clausewitz by emphasizing the management aspects inherent in the profession. The orchestration and direction of the violence, leadership and control over the riflemen, the craftsmen, should be the profession's expertise. However, Huntington's argument rests on ground forces examples, which are difficult to translate into Air Force scenarios without excluding large segments of the officer corps from professional status. Although it is organizationally difficult to label some officers professional and others not, or some officers part of the core of the profession and others as peripheral, the Air Force officer corps has actually done this successfully with pilots making up the core for decades. Nevertheless, the Air Force officer corps does not buy into Huntington's definition. The officer corps has been slow in making a bachelor's degree a prerequisite for membership, and technical degrees carry much more credence than liberal arts degrees at the general officer level because flying is perceived to be at the professional core. The real problem is that the Air Force officer corps cannot culturally accept a definition of expertise that implies a career field like air battle managers is at the professional

core, while many pilots, such as cargo and tanker pilots, would have no professional status at all.

### Giulio Douhet

Douhet is of importance for several reasons. First of all, he is generally credited as being one of the most coherent and widely read early advocates of airpower and the need for an independent air force service branch. This independent air force would be equal to the army and navy, and all three service branches would coordinate their activities, under a supreme command, to achieve victory.<sup>76</sup> In addition Douhet is frequently cited in Air Force materials, and his book, The Command of the Air, is often given to officers attending professional military education courses. Although it is somewhat ironic that an Italian general of the artillery is closely entwined with the origins of the US Air Force, he is nonetheless regarded by the Air Force as a pillar of airpower theory. Douhet is important for this study because his vision provides insights on the expertise of the Air Force officer corps.

Although a cursory skim of Douhet may leave the reader with the impression that Douhet is himself a proponent of the heroic warrior archetype, a closer reading indicates that this is not the case. For example, Douhet makes the point that the military must get away from the idea that aviation is some special incredibly complex and technical domain, too complicated for military officers. To Douhet, aviation is not the

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<sup>76</sup> Giulio Douhet, The Command of the Air, trans. Dino Ferrari (Washington: Air Force History and Museums Program, 1998) vii-x, 4-5, 70-71. Billy Mitchell also falls into the category of early advocates of an independent Air Force, but Mitchell's advocacy role greatly exceeds his theoretical contribution.



exclusive realm of technical specialists, and aviation is not a goal in itself. It must be subordinated to the needs of war. Douhet includes pilots under the term *technical specialists*.<sup>77</sup> Furthermore, it makes sense that Douhet, an officer of the artillery—not a pilot or other aviation technical specialist—who is a leading advocate of airpower and an independent air force in Italy, does not see a pressing need to be a pilot to understand airpower or lead its military development or command its combat application. For example, with respect to the independent air force, Douhet writes that:

There is a need of creating a competent body to supervise its growth, a body made up of men familiar with the art of war in general and open to new ideas. These men need not be technical experts; they need only be aware of the great possibilities of this new aerial weapon. That will be enough to begin with; for it is not a question of deciding the best profile of a wing, but of determining the best technical means available for creating a combat force and the best method of utilizing it in war.<sup>78</sup>

Douhet, the great airpower prophet, is calling for leadership by men such as himself, “men familiar with the art of war in general and open to new ideas,” men that need not be pilots.

In addition, Douhet also advocates removing technical responsibilities from the military. Douhet starts from the premise that civil aviation will develop airplanes and improve aircraft performance much more rapidly than the military, and that the military could purchase such aircraft more economically than developing its own. In the second edition, Douhet envisions civil aviation providing large numbers of transports and crews

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<sup>77</sup> Douhet 76, 85.

<sup>78</sup> Douhet 76.

that can be quickly converted into bomber aircraft.<sup>79</sup> Both editions are based on the premise that civilian aircraft, pilots, crews and support personnel can easily be converted for military use. As Douhet writes in the first edition:

Military aviation can cooperate still more in developing civil aviation by entrusting to the latter all activities not strictly military. The training of pilots, mechanics, maintenance and repair men—in short, all special technical instruction not strictly military—can be left to civil aviation. After all, pilots, whether civilian or military, must be masters of their ships; and mechanics, in or out of uniform, must know their motors and how to keep them running. All technical aviation instruction can therefore be left to private initiative, this lightening the burdens of the military authorities, reducing costs, and stimulating private responsibility.<sup>80</sup>

It is clear that Douhet grossly overestimated the ease with which civilian aircraft can be transformed into military combat aircraft, but his basic concept that there is tremendous overlap in the basics of pilot training, flight operations and maintenance remains valid. The Civilian Reserve Air Fleet program is based on the idea that civilian passenger and cargo aircraft and crews can be used as is for military purposes. The fact that the first transport aircraft hit by an insurgent-fired surface-to-air missile (SAM) near the Baghdad International Airport was a DHL cargo aircraft illustrates the clear overlap between military cargo/transport aircraft and their civilian counterparts.<sup>81</sup> In addition,

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<sup>79</sup> Douhet 128.

<sup>80</sup> Douhet 82-85.

<sup>81</sup> The Air Force and Air Force-oriented publications like *Air Force Times* naturally focused more on the C-17 hit on 9 Dec 2003 and the C-5 hit on 8 Jan 2004, but the DHL Airbus A300 cargo carrier was hit on 22 Nov 2003. All three aircraft were able to make safe emergency landings back at Baghdad International Airport despite the damage to their engines and flight controls. The DHL was not equipped with antimissile defenses, but its crew was as lucky or as well-trained as the Air Force crews in bringing the battle-damaged aircraft back with a safe landing. See Bruce Rolfsen, "C-5 takes enemy fire leaving Baghdad," *Air Force Times* 19 Jan 2004: 10; Bruce Rolfsen, "Targets in the sky," *Air Force Times* 26 Jan 2004: 14.



the Air Force is now using civilian contractors to provide the introductory phase of pilot training. Furthermore, Air Force navigator training, which was initially provided by Pan Am before World War II, is currently transitioning from an Air Force program to a joint navigator training with the Navy. Consequently, although the Air Force has an expertise in flying, it does not have anything close to a monopolistic jurisdiction over flying training, flight operations, or even flying combat operations. Douhet understood that fact was looking for efficiencies in training, equipping and flying aircraft in war. His view of air force officership expertise revolves around flying combat operations under a joint commander, but a shared jurisdiction with civilian aviation for the development of aircraft and the training of crews and other aviation specialists.

Consequently, from the heroic warrior perspective Douhet paints a very limited expertise for the air force officer corps. A military profession can hardly base its claim for total jurisdiction over aerial warfare on an expertise, i.e., piloting aircraft, which the military itself goes to civilian groups to acquire. Furthermore, if civilian aircraft, pilots, and mechanics can be turned military overnight, the differentiation between the civilian and military air worlds cannot be great. Even adding the military-specific skill of bombing cities brings little more to the claim. However, if the expertise is bringing new ideas to the art of war, the bounds of the expertise are virtually unlimited, which is the visionary warrior archetype's view. Both the heroic and visionary perspectives were necessary in the struggle for jurisdiction over airpower and an independent air force officer corps. Airplanes symbolized the newest frontier of warfare. In the 1920s and



1930s no one had a real inkling of the shape of things to come. Rockets, radars, and computers were still primarily considered to lie within the realm of fantasy. There was no perception of a need for an independent military service to dominate new ideas, but the case could be made for a new, innovative organization to revolutionize warfare via airpower.

Douhet's writings were a clear attempt to gain public and legal jurisdiction for an independent air force officer corps in Italy. His works were translated and widely read, and his ideas promulgated by airpower enthusiasts in Europe and America. His arguments are also important because they highlight four characteristics frequently found in airpower public relations work. The first characteristic is the vision that air forces could win the next war by jumping over the ground and maritime forces and striking directly at the heartland of the enemy. This is done primarily to avoid the high casualties and inefficiencies of ground or naval warfare, but its byproduct is a lessening of the importance of the ground and maritime forces.<sup>82</sup> The second characteristic is the

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<sup>82</sup> In the first edition of The Command of the Air, Douhet writes that the independent air force would primarily be responsible for strategic-style bombing operations, but that jurisdiction over other forms of work such as close air support, transport aviation and aircraft development would be shared to some extent. However, in the second edition of Douhet adds a Part II, which is included in the Air Force compilation and in which he roundly castigates the idea of auxiliary aviation (army and naval air forces) as "worthless, superfluous, harmful" (p.94). Douhet writes that he discussed auxiliary aviation in the first edition merely to keep from appearing to be too radical. Furthermore, he maintains that the astute reader should have understood anyway that auxiliary aviation was a contradiction to an Independent Air Force seeking command of the air. However, he apparently confused part of his readership, and proclaims that publishing the entire discussion on auxiliary aviation was a mistake. In order to achieve command of the air, i.e., "that state of affairs in which we find ourselves able to fly in the face of an enemy who is unable to do likewise," auxiliary aviation is a liability (pp. 93-95). All aircraft must single-mindedly work to achieve command of the air under the single independent air force command, and only afterwards, might the independent air force detach some aircraft to support the army or navy (pp 99-100). Of course, even

downplaying of the dichotomy between the claim of relative bloodlessness and quick victory on the one hand and the large-scale destruction of the enemy's civilian population, cities and way of life on the other. After all, Douhet was advocating the "direct attack against the moral and material resistance of the enemy," i.e., the bombing and gassing of cities:

Tragic, too, to think that the decision in this kind of war must depend upon smashing the material and moral resources of a people caught up in a frightful cataclysm which haunts them everywhere without cease until the final collapse of all social organization. Mercifully, the decision will be quick in this kind of war, since the decisive blows will be directed at civilians, that element of the countries at war least able to sustain them. These future wars may yet prove to be more humane than wars in the past in spite of it all, because they may in the long run shed less blood. But there is no doubt that nations who find themselves unprepared to sustain them will be lost.<sup>83</sup>

The third characteristic is the emphasis on the offensive, coupled with the intent to push the permissible bounds of warfare and take it to new dimensions. The fourth characteristic is the predisposition to generously extrapolate the development and fielding of new technology and to blend distinctions between future and current capabilities. The four characteristics are entwined and form a fundament of airpower theory.

Arguments used by both archetypes generally adhere to these characteristics, but with major caveats on the bombing of cities. In today's world, neither would wholeheartedly endorse attacking the enemy's civilian population, and both are keen on

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at this juncture, Douhet is vehement that such support would detract from the independent air forces primary task after achieving command of the air: Crushing the material and moral resistance of the enemy (p. 125).

<sup>83</sup> Douhet 61.



improving technology to avoid the dichotomy, or perhaps moral dilemma. Both are also willing to ignore Douhet's total focus on attacking the civilian population; instead both favor providing at least some support to ground or maritime forces. Whereas the heroic warrior tends to be more literal in terms of the central role of the airplane in Douhet's proposition, the visionary warrior tends to raise Douhet to a higher level of abstraction. This more easily accommodates non-piloted aircraft technologies like intercontinental ballistic missiles (ICBMs) into the paradigm. An even higher level of abstraction allows electronic warfare, information warfare, and the concept of effects-based operations to fit under the same umbrella. That is, using technology to avoid industrial age warfare with its potential for stalemates and large losses of personnel on the ground or at sea and concurrent spillover effects on the civilian population.

### Conclusion

Douhet, the airpower advocate, does not advance flying as the expertise of an air force profession. Instead, his expertise is that which can be provided by men who are familiar with the art of war and open to new ideas, men who can create a revolutionary combat force and direct that force in battle. Von Clausewitz proffers *military genius*, Huntington, management of an organization conducting violence, and Douhet, a revolution in military affairs. They are somewhat akin to the story of the blind men, each touching a different part of an elephant, trying to describe the whole. That whole is not flying, piloting or aircraft *per se*. It is the ability to create the force and lead that force through the fog and the friction of war while remaining open to new ideas. The



Air Force officer corps is still very much about flying and airpower, but that is no longer its primary focus. Over time, it has developed C4ISR in order to support commanders' *military genius* and to manage the organization's application of violence, while simultaneously opening the door to further visionary forms of warfare such as information warfare and effects-based operations. That is the Air Force officer corps' expertise.

If that is the case, why do so many of its members and the public in general think that the Air Force is all about flying? The answer to that question lies in the simplicity of the airplane as the symbol of the changing character and nature of warfare as well as in the history and traditions of the Air Force officer corps and its predecessors. Flying has never really been the officer corps' expertise. Instead, the expertise is best captured by the term *airpower*, which can loosely be described as the management and application of military force through the medium of air. American airpower concepts rested on the airplane, which in turn rested on pilots. Airpower also rested on intelligence, weapons technology, and a command, control and communications system to plan and direct the air forces in battle. However, as will be discussed in Chapters 7 and 8, the officer corps of the Air Force's predecessors was quick to focus on the simplified equation of airpower equals airplanes and pilots. The public and its representatives were also willing to accept the simplified equation. Consequently, it was easy enough to confuse the technical skill of flying with the more abstract expertise of airpower.

However, as new technologies emerged and world events unfolded, the Air Force's missions and the officer corps' jurisdictions began to change. These changes are covered in Chapter 4. The concept of airpower began to change, moving from an airplane-centric view as it absorbed tertiary supporting areas. New technologies for aircraft and weapons meant that fewer aircraft were needed to accomplish more tasks. This point is made in more detail in Chapter 5, which examines how aircraft and weapons technology is shifting the locus of decision-making out of the cockpit. As quality began to substitute for quantity, it became more important to have centralized control over these fewer aircraft. In addition, targeting and planning required more intelligence support. Furthermore, the growth of radios, radar, and command and control systems led to the need to counter enemy radar, radios, and command and control. Things like the use of space for communications, navigation, and reconnaissance, electronic warfare, information and cyber warfare that initially were developed to manage, lead, assist, or protect aircraft doing airpower began to eclipse aircraft in importance. The term *airpower* was being contorted in all sorts of ways, and no longer fit. C4ISR and visionary forms of warfare were born out of airpower, but break out of the medium-defined box of jurisdictions. C4ISR and visionary forms of warfare go beyond airpower and incorporate space, the electronic ether, counter-command and control, and cyber and information warfare. Chapter 6 examines the evolution of the command and control system in the Air Force as part of this overall shift in the officer corps' expertise.

## **Chapter 4: Data Shows Growth in the Expertise of C4ISR and Visionary Forms of War**

### Introduction

The preceding chapter presented the theory-based argument that piloting aircraft is not the core expertise offered by the Air Force officer corps, although it is often perceived to be so. Instead of the technical skills involved in flying an aircraft, concepts of profession require a higher-level, more abstract knowledge that can be used to process incomplete information and make critical life-or-death decisions while leading others engaged in combat. In von Clausewitz' terms this is *military genius*, but the heroic warrior would feel more comfortable with the term *airpower* and the visionary warrior thinks in terms of C4ISR and visionary forms of warfare. This chapter serves as a transition from the more abstract discussions on theories of profession (Chapter 2) and the Air Force officer corps' expertise (Chapter 3) to a more data-based argument. This is done by examining data on the various Air Force self-described fields of expertise and jurisdictions—not by what is said, but by how the Air Force is organized and allocates its weight of effort. The Air Force's sense of mission, its aircraft, squadrons, personnel, and budgets all point to the fact that the work that the Air Force officer corps performs, or its expertise, has not remained static over its short history. Instead, the Air Force officer corps' work and weight of emphasis between various types of work remains dynamic. As Abbott writes, a profession's expertise evolves in response to jurisdictional competition, the creation of new jurisdictions, and



the demise of old ones. There is data to support my contention of the rising importance of command and control systems, or what the Air Force is now calling “C4ISR,” or Command, Control, Communications, Computers, Intelligence, Surveillance and Reconnaissance within the profession.

This chapter begins with a review of how the Air Force has described the organizational structure of its combat units over the years in the annual USAF Statistical Digest series since this directly connects to how the officer corps perceived Air Force fields of expertise and jurisdictions. The chapter then examines the evolving weights of effort in terms of the numbers of squadrons per different types of work as an indication of the Air Force officer corps’ relative weighting assigned to these types of work. This is followed by an examination of the relative weighting given to different types of flying over the Air Force’s history in terms of aircraft and flying hours. Next is an examination of high-level personnel statistics that show the relative distribution of general officer and total officer among the various Air Force major commands and career field billets. Finally, Air Force budgetary Total Obligational Authority and personnel weighting by budgetary Major Force Category round out the discussion and also show the changing nature of the Air Force officer corps’ field of expertise, marked by the increasing contribution of C4ISR.

#### The Changing Air Force Sense of Missions and of Jurisdiction

The USAF Statistical Digest series provides ample data to support my contentions that the expertise of the Air Force officer corps is not static, but evolving,

and that as part of this evolution C4ISR has become a critical field of the profession's expertise. A historical review of the series' coverage of Air Force combat and combat support units provides data points in the evolution of what the Air Force officer corps saw as its primary missions or fields of expertise. It also reveals that for most of the history of the independent Air Force, the organizational culture emphasizes flying units almost to the exclusion of non-flying, ground-based combat and combat support units. Consequently, indications of the growing importance of C4ISR are often hidden or tangential when looking simply at combat and combat support units. Nevertheless, despite the attention on flying units, there still are indications of the evolving importance of C4ISR to the Air Force officer corps.

The 1947 USAF Statistical Digest, which covers the Air Force's establishment as an independent service in September 1947, is divided into the following parts: 1) Combat Groups; 2) Personnel, Military and Civilian; 3) Training; 4) Aircraft and Material; 5) Flight Operations; 6) Miscellaneous; and 7) Civilian Components (ANG, AFR, AFROTC).<sup>84</sup> This is a relatively straightforward view of how the Air Force officer corps saw its major activities. The USAF Statistical Digest led off with the Air Force's *raison d'être*, air combat units. The rest of the sections described supporting functions. The Air Force required people, who in turn required training. The Air Force also required aircraft and other materiel. The USAF Statistical Digest then provided a summary of its flying operations, the heart of its perceived expertise and jurisdiction,

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<sup>84</sup> USAFSD 1947 IX.



and mentioned that it has a reserve component. However, the simplicity of this approach did not last. *Volume I* of the 1948 USAF Statistical Digest expanded to 14 parts.<sup>85</sup> The Jan 1949 – Jun 1950 USAF Statistical Digest increased to 16 parts and the FY 1951 USAF Statistical Digest further expanded to 19 parts.<sup>86</sup>

Although we will continue with an examination of the organizational schemes of the annual USAF Statistical Digest series through FY2003, this brief introduction is enough to make some conclusions on the initial Air Force officer corps' view of its expertise. First, and foremost, the Air Force led off with what it considered most

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<sup>85</sup> The 14 parts of the 1948 USAF Statistical Digest Volume I are: 1) Tactical Units; 2) Personnel (Military and Civilian); 3) Training (Military and Civilian); 4) Ground Safety; 5) Medical; 6) Material; 7) Aircraft Accidents; 8) Installations; 9) USAF Industrial Reserve; 10) Air Transport Command – Military Air Transport Service; 11) Transportation; 12) Fiscal; 13) Reserve Forces (Includes Air Scouts); and 14) The Berlin Airlift. See Headquarters United States Air Force, Office of the Comptroller, Directorate of Statistical Services, United States Air Force Statistical Digest 1948 Vol. I (Washington: HQ US Air Force) XIII. Although *Volume II*, which was originally classified, contained only five parts: 1) Tactical Units; 2) Aircraft and Materiel; 3) Flight Operations; 4) USAF Reserve Forces; and 5) Military Personnel. See Headquarters United States Air Force, Office of the Comptroller, Directorate of Statistical Services, United States Air Force Statistical Digest 1948 Vol. II (Washington: HQ US Air Force) VII.

<sup>86</sup> The 16 parts of the Jan 1949 – Jun 1950 USAF Statistical Digest are: 1) Tactical Units; 2) Personnel (Military and Civilian); 3) Training (Military and Civilian); 4) Medical; 5) Flying Safety and Ground Safety; 6) Aircraft and Materiel; 7) Aircraft Engines and Propellers; 8) Flight Operations; 9) Transportation; 10) Installations; 11) Research and Development; 12) Fiscal; 13) Stockpiling; 14) Mutual Defense Assistance Program; 15) USAF Reserve (USAF Reserve and Air National Guard), ROTC, CAP, and Explorers; and 16) Civil Relief Type Operations (Operation "Vittles" [Berlin Airlift] and Operation "Hayride" [Winter Storm relief in the Rocky Mountain states]). See Headquarters United States Air Force, DCS Comptroller, D Statistical Services, United States Air Force Statistical Digest JAN 1949-JUN 1950 (Washington: HQ US Air Force) V-XIV. The 19 parts of the FY 1951 USAF Statistical Digest are: 1) Korean Air Activity; 2) Combat Units; 3) Flight Operations; 4) Safety (Flying and Ground); 5) Aircraft and Materiel; 6) Aircraft Engines and Propellers; 7) Oils and Lubes; 8) Stockpiling; 9) Industrial Reserve; 10) Transportation; 11) Research and Development; 12) Fiscal (Budget, Procurement, and Miscellaneous); 13) Housing and Installations; 14) Mutual Defense Assistance Program; 15) Personnel (Military and Civilian); 16) Training; 17) Medical; 18) Morale; and 19) Reserve Forces (USAF Reserves and Air National Guard) ROTC, CAP, and Explorers. See Headquarters United States Air Force, DCS Comptroller, D Statistical Services, Operations Statistics Division, United States Air Force Statistical Digest Fiscal Year 1951 (Washington: HQ US Air Force) 5.



important—its combat or tactical units. This was the first section in each edition until the Korean War bumped it to second place. *Combat* units were defined as follows:

Combat Unit: A classification of military force having an organization prescribed by the Department of the Air Force, the primary mission of which is one or more of the following:

1. Destruction of enemy forces, resources, and/or installations, for example, bombardment and fighter units, and Troop Carrier Units which have a mission of providing airlift for Combat elements.

2. Furnishing operational assistance to combat elements, for example, reconnaissance, troop carrier, and separate units.

Separate squadrons... are those squadrons consisting of designated types other than those comprising a Combat Group or Wing structure and having a mission of furnishing operational assistance to combat elements.<sup>87</sup>

Separate squadrons included in the list of combat units were strategic weather reconnaissance, air rescue, liaison, aerial resupply, tow target, and Military Air Transport Service (MATs) long-range or “strategic” air transport.<sup>88</sup>

Consequently, the early Air Force officer corps initially possessed three areas of combat expertise, which coincidentally mirrored its three types of combat aircraft: 1) Bombers, which were the basis of strategic aerial bombardment and long-range, bomber-based reconnaissance; 2) Fighters, which were the basis of air-to-air combat, whether as bomber escorts, combat air patrols or air defense; fighter air-to-ground attacks; and fighter-based tactical reconnaissance; and 3) Transports, which transported ground troops and equipment in the theater of combat operations, including for airborne assaults. In addition, specific types of flying units such as weather reconnaissance, air

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<sup>87</sup> USAFSD FY1951 91.

<sup>88</sup> USAFSD FY1951 91.

rescue and MATS directly supported the combat forces. These are examples of further fields in which the Air Force held some jurisdiction.

The Air Force officer corps did have a monopoly jurisdiction over strategic aerial bombardment, but far less than monopoly jurisdictions over fighter and air transport operations. Strategic bombing was the foundation of the claim for an independent Air Force, and it would have been senseless for society to allow the creation of an independent air force officer corps without granting it this monopoly jurisdiction. However, the Air Force officer corps did not have a monopoly jurisdiction over fighter operations since Navy and Marine Corps aviation provided the same services. There was a division of labor within the Department of Defense that generally kept Navy and Marine Corps aviation with things “naval” and Air Force fighters with either independent Air Force operations or in support of Army operations. However, direct support of Army operations such as in close air support missions splits the jurisdictional seam between the Army and Air Force. Consequently, it remains a source of jurisdictional tension between the officer corps of the two services. The Army and Air Force have also periodically clashed over in-theater air transport for the same reason.<sup>89</sup> With respect to long-range air transport, MATS contained Navy long-range transports and aircrews. This lent credence to the Air Force claims to have both the lead and to be the dominant force in this jurisdiction. However, the Navy and Army

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<sup>89</sup> The Air Force has always had a relatively unchallenged monopoly over the jurisdiction of providing the aircraft for large-scale airborne operations, which is another seam issue. The numbers and size of aircraft required for such operations would be prohibitive for the Army and seen as needless duplication by the public.

both retained short-range transport aircraft, and MATS contracted out the transportation of some military lift to civilian air carriers.<sup>90</sup> In addition, the Navy provided its own weather and air rescue capabilities.

There was no indication of any C4ISR role in the early USAF Statistical Digest editions because at that time, Air Force tactical or combat units were by definition flying units. No ground-based units were listed. In addition, all other flying units were clearly of secondary importance. They and the unlisted ground-based units existed to support the “pointy end of the spear”—the combat forces.

However, by FY1952 things began to change. The USAF Statistical Digest tinkered with its categorization of combat-type units, and missions became the basis of differentiation instead of aircraft types. At the highest level, the table was divided into three categories: The first was combat and airlift, the second support forces, and the third separate squadrons. By FY1953, combat forces were subdivided into *strategic*, *air defense*, and *tactical*. Strategic war assets included heavy and medium bombers, strategic reconnaissance, both heavy and medium, and its own fighter escorts, also known as strategic fighters. Air defense became a world unto itself with fighter-interceptors, which is interesting because the fighter-interceptors were almost useless without the ground radar and command and control system’s direction. Tactical war

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<sup>90</sup> For example, in FY 1957 the USAF shipped 62,154 military dependents outbound from the continental US to overseas destinations. 31,909 went via the Military Sea Transportation Service, 14,173 went via MATS, and 16,072 went via commercial air. See Headquarters United States Air Force, Comptroller of the Air Force, Directorate of Statistical Services, United States Air Force Statistical Digest Fiscal Year 1957 (Washington: HQ US Air Force) 204.



assets included light bombers, fighter-bombers, and tactical reconnaissance aircraft. The airlift category contained the troop carrier wings. Support Forces initially was limited to air refueling and MATS; separate squadrons included a "Pilotless Bomber, Light."<sup>91</sup> The pilotless bomber squadrons received their own category in FY 1954. In FY1955, the separate squadrons were combined under support forces. The pilotless bomber squadrons (guided missile squadrons in June 1953) were listed as a separate category under support forces because they were not yet operational. Nevertheless, this was an important, but complex step. On the one hand, the inclusion of pilotless bombers indicated a rather visionary professional readiness to move beyond manned flight as a combat expertise. On the other hand, calling the surface-to-surface missiles pilotless bombers staked out a jurisdictional claim. Surface-to-surface missiles might appear to some people to be essentially artillery, but *bombers*, whether manned or unmanned, clearly belonged in the Air Force officer corps' monopoly jurisdiction. It also cast missiles in the role of things flying, with all the inherent mystique. Consequently, pilotless bomber units, and later tactical and strategic missile units, were included with aircraft units in the USAF Statistical Digest series.

The FY 1957 USAF Statistical Digest marked another change in the conceptualization of Air Force combat forces. Categorization by missions was beginning to give way to a categorization by major command. At the highest level, Air

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<sup>91</sup> Headquarters United States Air Force, Deputy Chief of Staff Comptroller, Directorate of Statistical Services, United States Air Force Statistical Digest Fiscal Year 1952 (Washington: HQ US Air Force) 84.

Force combat-type forces were divided into *Major Wings*; and *Support Forces (Flying)*. Major Wings were divided into strategic, air defense, and tactical, and the guided missile squadrons were switched from support to tactical combat forces. The term *Support Forces (Flying)* indicates that there were indeed non-flying support forces that did not merit inclusion in the table. The Support Forces (Flying) included “troop carrier group, assault,” air refueling squadrons, MATS units, which eventually contained the air rescue, mapping and charting and weather reconnaissance aircraft, and separate units. However, air refueling units were divided into SAC (Strategic Air Command) and TAC (Tactical Air Command) units. The troop carrier units were also split with 10 squadrons going to the tactical forces, and two under separate units.<sup>92</sup> These changes resulted in a clearer categorization along the lines of the Air Force major command structure.

First and foremost was strategic bombing with tanker support, strategic reconnaissance aircraft and some fighter escorts, meaning basically SAC. From World War II through 1957 and beyond, SAC was the strategic force of the United States. SAC’s bombers were the only force capable of providing the long-range delivery of nuclear or conventional weapons to targets deep in the enemy homeland. The Air Force officer corps had undisputed and full jurisdiction in this area. Although Sputnik was launched in autumn of 1957, intercontinental ballistic missiles and submarine-launched ballistic missiles were still things of the future. The second area of potential jurisdiction

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<sup>92</sup> USAFSD FY1957, 3.

was represented by the air defense interceptors of Air Defense Command (ADC). However, counting fighter-interceptor units without mentioning the ADC radar, command and control and communications network that directed the fighter-interceptors was myopic and representative of a culture that measured importance in terms of aircraft and flying. Nevertheless, the EC-121 Airborne Early Warning and Control squadrons, which were a flying element of the ADC command and control system, began being reported under Separate Units in FY1954. The Air Force held a near monopoly jurisdiction over the strategic air defense of the continental United States. Operational surface-to-air missiles were still futuristic.

The third, but the most diverse, jurisdiction was the wide range of tactical air forces that ran the gamut from tactical bombers to fighters, tankers, transport aircraft and the new-fangled tactical surface-to-surface missiles. The tactical surface-to-surface missiles gave the Air Force a new weapon in terms of technology and potentially stretched the conventional understanding of airpower, but the surface-to-surface missile was cast as one of many types of ‘flying’ under the general jurisdiction of tactical air operations. The tactical forces were found in TAC or in the tactical geographic-based commands of the Air Force in Europe (USAFE) and Pacific Air Forces (PACAF), formerly the Far East Air Forces (FEAF). The Air Force continued to share the tactical air jurisdiction with the other services. The fourth, and supporting, jurisdiction was strategic or long-range transport, embodied by MATS, with no change to the Air Force officer corps’ jurisdictional dominance over Navy long-range air transport and control



over contract civilian air transport. The rest of the Air Force supported these jurisdictional claims and forces. In terms of market share of the jurisdictions, the Air Force officer corps maintained its monopoly on strategic bombardment and dominant position over long-range air transport. The term *tactical air* replaced *fighter operations*, but it remained a shared jurisdiction. However, a segment of the fighter operations market, the strategic air defense of the US, was split off, forming a new, near monopoly jurisdiction for the Air Force officer corps. This jurisdiction were based on the largely non-flying C4ISR system at least as much, if not more so, than the fighter-interceptors.

In 1958, strategic missile units were included under the strategic units. One could argue that this new technology formed a new jurisdiction. However, the Air Force officer corps had already switched from a platform-based differentiation of skill sets to a mission, or major command, based differentiation. From this new perspective, strategic missile units provided the same deep strike that bombers did. Consequently, the technology redefined the jurisdiction from strategic manned bombardment to simply strategic bombardment. Nevertheless, strategic offense was now on the way to being divided into three distinct fields as seen from a technology perspective, with each vying for the same work and competing for a piece of the same jurisdiction. The Air Force officer corps had monopolies over manned and unmanned strategic bombers (MRBMs/ICBMs), but the Navy officer corps eventually created its Submarine-Launched Ballistic Missile (SLBM) jurisdiction.

In the FY 1959 USAF Statistical Digest combat flying support forces were divided into strategic, air defense and tactical forces for the first time.<sup>93</sup> This made clear the allocation of the airborne early warning and control, radar evaluation, electronic counter-measures, tow targets, and drone squadrons to air defense combat flying support forces. Fighters were removed from the strategic forces, and the rather visionary “intercept missile” units were added to air defense forces. The new categorization indicates that the air defense forces contained a wide variety of innovative fields. The airborne early warning and control aircraft (EC-121) squadrons were listed through the late 1970s, when paradoxically, the replacement E-3 Airborne Warning and Control (AWACS) squadrons that were forming were not included in the combat and support unit table in the USAF Statistical Digest series. The airborne early warning and control EC-121 aircraft were designed to be an aerial extension and gap-filler for the ground-based command and control system. However, the crew performed the same work that ground-based command and control sites performed. Consequently, the EC-121s were the first reference, albeit elliptical, to the command and control, or C4ISR, expertise. This C4ISR expertise was the foundation of the strategic air defense system and the basis for the Air Force officer corps’ near monopoly jurisdiction over the strategic air defense of the US. The surface-to-air interceptor missile (*unmanned*

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<sup>93</sup> Headquarters United States Air Force, Comptroller of the Air Force, Directorate of Statistical Services, United States Air Force Statistical Digest Fiscal Year 1958 (Washington: HQ US Air Force) 3. Headquarters United States Air Force, Comptroller of the Air Force, Directorate of Statistical Services. United States Air Force Statistical Digest Fiscal Year 1959 (Washington: HQ US Air Force) 3.

*interceptors*) system introduced new technology that competed with manned fighters for jurisdiction over the downing of enemy aircraft as a subset of the broader air defense jurisdiction. Officers sitting in front of radar screens on the ground directed the fighter-interceptors and launched the surface-to-air missiles that would shoot down enemy aircraft. In addition, radar evaluation units and electronic counter-measures units worked in an area that eventually would be seen as a separate jurisdiction—electronic warfare. It is also formed the initial basis of counter-command-and-control warfare. Finally drone target squadrons offered a capability that competed with towed targets briefly before replacing them entirely. The ability to control of drones, however, offered the opportunity for the large scale control or flying of unmanned aircraft or unmanned combat aircraft. Consequently, strategic air defense was heavily involved in C4ISR and visionary forms of warfare.

The FY 1966 USAF Statistical Digest used new category titles and provided definitions for the first time of the forces' *primary tasks*. Strategic combat and strategic combat flying support forces were lumped together under the title *Strategic Retaliatory*, which demonstrated the officer corps' interest in maintaining pace with the political rhetoric of the day. The nuclear arsenal was now conceptually *retaliatory*. Previously, *strategic* carried the connotation of *offensive*. Strategic Retaliatory forces had “long-range weapons delivery” as their primary task. These forces included heavy and light bombardment, strategic reconnaissance, air refueling, Post-Attack Command and Control System, Missile Augmentation (AGM-28 equipped B-52) squadrons and



strategic missile squadrons. The missile augmentation squadrons represent another acceptance of a visionary technology since the addition of cruise missiles changed the B-52 bomber employment scenario from that of the heroic warrior flying over the target to that of a launch vehicle simply bringing the second stage within range of its target. Air defense and air defense flying support forces were lumped together under *Continental Air and Missile Defense*. Continental Air and Missile Defense forces' primary task was "defending the US against enemy aerospace attack." The Soviet Union's ability to attack the US homeland from air and from space was acknowledged. This indirectly implied a jurisdiction for ADC to develop technology in space to both detect and defend against enemy missiles and enemy exploitation of space. However, the only forces listed were the fighter-interceptor, airborne early warning and control, drone, defense system evaluation and interceptor missile squadrons. SAC's Post-Attack Command and Control System and ADC's airborne early warning and control units were included in the table because they were aircraft-based. The rest of the Air Force's command, control and communications systems, being ground-based, were not culturally considered combat or combat support forces.

Tactical combat and tactical combat flying support forces were combined under the title, *General Purpose*. General Purpose forces had the primary task of "attaining air superiority over battle areas, providing close air support and interdicting enemy supply and communications facilities." These forces included tactical bomb, tactical fighter, tactical reconnaissance, tactical fighter interceptors in PACAF, USAFE and

Iceland, special air warfare (special operations), tactical air control system (forward air controller airborne), airborne command post (CINCS), and tactical missile squadrons. Tactical air refueling squadrons were eliminated. The inclusion of the tactical air control system units is an explicit reference to the command and control system, or C4ISR, expertise. However, only Forward Air Control (FAC) units, which are flying units, were included. Nevertheless, the FAC category, which is just the tip of the command and control system, continued as a USAF Statistical Digest category through FY2003 and beyond.<sup>94</sup> It is also noteworthy that the officer corps understood the importance of communications in modern warfare enough to warrant listing enemy communications facilities as a target even though Air Force command, control and communications units, being non-flying, did not merit inclusion in the table. *Airlift and Sealift* became its own, equal category containing military airlift, aeromedical airlift, and special air mission military airlift squadrons. Airlift and Sealift had the primary task of “air logistics support.” *General Support* contained the usual leftovers of mapping and charting, aerospace rescue and recovery, weather reconnaissance, and the National Emergency Airborne Command Post (NEACP, which began to be reported in FY 1963). General Support forces’ primary task was vaguely defined as providing “specified technical services.”<sup>95</sup>

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<sup>94</sup> The FAC flying squadrons are captured under the category “Other” in the reintroduced USAF Statistical Digest series.

<sup>95</sup> Headquarters United States Air Force, Comptroller of the Air Force, Directorate of Data Automation, Data Services Center, United States Air Force Statistical Digest Fiscal Year 1966 (Washington: HQ US Air Force) 1, 3.

The FY 1967 USAF Statistical Digest established tactical electronic warfare units in the *General Purpose* category and changed several category titles. The concept of strategic retaliation with its inherent denial of preemption was short-lived and *Strategic Retaliatory* became *Strategic—Offensive*. *Continental Air and Missile Defense* became *Strategic—Defensive*. *General Support* became *Intelligence and Communications* without changing the types of units listed or the category's definition.<sup>96</sup> Although *Intelligence and Communications* implied a much broader C4ISR category that could include a variety of ground-based units, non-flying units were still excluded. In fact, the moniker *Intelligence and Communications* was misleading since it still only contained mapping, charting and geodesy, weather service, aerial target tow, aerospace rescue and recovery and the NEACP units. The actual intelligence and communications C4ISR systems remained shrouded in mystery.

This categorization and the basic definitions of primary tasks remained in effect through the FY 1980 USAF Statistical Digest, after which the USAF Statistical Digest was discontinued until the FY 1991 Estimate USAF Statistical Digest. In the interim, the 1981 USAF Summary and the 1982 USAF Summary both contained essentially the same table with the categories of *Strategic-Offense*, *Strategic-Defense*, *General Purpose*, and *Airlift*. The *Intelligence and Communications* category and units were no

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<sup>96</sup> Headquarters United States Air Force, Comptroller of the Air Force, Directorate of Data Automation, Data Services Center, United States Air Force Statistical Digest Fiscal Year 1967 (Washington: HQ US Air Force) 1, 3.



longer reported.<sup>97</sup> Then the table dropped out of the USAF Summary series until the 1986 USAF Summary when it appeared under the title “USAF Flying Squadrons by Function.” All categorizations were dropped in the new table. It simply listed the numbers of squadrons by type. However, the table included ground-based command and control units for the first time, despite the fact that the title specifically limited it to flying squadrons.<sup>98</sup> The inclusion of the ground-based command and control units offers the first direct evidence that such units are a particular Air Force officer corps’ expertise and potential claim for jurisdiction in their own right because these are the only ground-based, non-missile units ever included in these tables. Consequently, their inclusion is more significant than that of the airborne early warning and control aircraft and FAC flying units. This version of the table continued through the reintroduction of the FY 1991 Estimate USAF Statistical Digest. There was a general consolidation of the table in FY1997. In the process, the table’s contents reverted to flying squadrons only, although the title, “AF Squadrons by Mission Area” no longer appeared to limit the table to only flying squadrons. The table dropped all mention of ground-based

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<sup>97</sup> Comptroller of the Air Force, Directorate of Cost & Management Analysis, USAF Summary 1981 (Washington: HQ USAF) FOR 11. Comptroller of the Air Force, Directorate of Cost & Management Analysis, USAF Summary 1982 (Washington: HQ USAF, 1982) 3-11. Although the table is continued through the USAF Summary series of the 1980s and the reintroduced USAF Statistical Digest in the 1990s, the table is no longer the lead chapter of the publication. Instead of being the major part of a relatively small, but nevertheless important and lead chapter, from 1981 on the table is buried in a back section. The lead chapter and the emphasis of the USAF Summary series and the later USAF Statistical Digest versions concerns financial and budget issues.

<sup>98</sup> Headquarters United States Air Force, Comptroller of the Air Force, Directorate of Cost, Economics and Field Support Division, United States Air Force Summary 1986 (Washington: HQ USAF, 1986) D-2A.

command and control units, which first appeared in the table in FY1986.<sup>99</sup> In addition, ICBM squadrons, which had been reported since FY 1958 and obviously continued to exist and make up a major part of Air Force combat power, were also dropped. Some C4ISR and visionary warfare units were briefly exposed, but then covered up by a heroic warrior culture that stresses the airplane and manned flying as the pillars of the Air Force officer corps' expertise.

Consequently, the review of the USAF Statistical Digest series reveals that the Air Force officer corps consistently made claims of jurisdiction in four areas: 1) Strategic attack; 2) Strategic air defense of the US; 3) Tactical air forces; and 4) Air Transport. From the USAF Statistical Digest perspective, the flying parts of the strategic air defense forces eventually merged into tactical forces, leaving three jurisdictions. However, another interpretation is that the strategic air defense jurisdiction has largely passed to the reserve forces, and its two active duty successors, space and C4ISR, are generally ignored by the USAF Statistical Digest series. With respect to the degree of monopoly over the three remaining jurisdictions recognized in the USAF Statistical Digest, the Air Force provides the strategic bomber and the ICBM legs of the strategic triad, which is the complete strategic attack jurisdiction. Consequently, the Air Force officer corps shares, and to a degree, therefore, competes with the Navy within the strategic attack jurisdiction. Air Force tactical forces continue

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<sup>99</sup> Air Operations Centers (formerly Tactical Air Control Centers), Air Control Squadrons (including Air Control and Reporting Centers and Control and Reporting Elements)



to share, and therefore compete, with the other services in the tactical air force jurisdiction. The Air Force continues to provide the bulk of long-range air transport among the services, but is supplemented by contracted civilian air transport, which in turn must be seen as the biggest competitor in the long-range air transport jurisdiction. With respect to tactical, or short-range, airlift, there continues to be some overlap, and therefore competition with the other services, although the Air Force retains a monopoly over airplanes capable of conducting a large-scale airborne assault.

The USAF Statistical Digest series tangentially indicates the importance of command and control systems through the listing of the airborne early warning aircraft from the mid 1950s through the late 1970s, the flying strategic offensive command and control systems like the Post-Attack Command and Control System and NEACP, the flying FAC units from the mid 1960s through the present, and the ground-based command and control system units from FY 1986 through FY 1996. In addition, several non-piloted, visionary systems are mentioned at early stages in the Air Force's history. These systems include the pilotless bombers, both shorter and intercontinental versions, the surface-to-air missiles, and the air-launched cruise missile. However, the abrupt exclusion of the ICBMs from the list of Air Force combat units indicates the organizational culture's focus on flying. There are many other signs of the heroic warrior archetype's prevalence. For example, the AWACS squadrons, which came on line in the late 1970s, did not merit a category in the table, although the AWACS' forerunner, the airborne early warning EC-121 squadrons did. The ground-based



command and control system units were taken off the table, although they were obviously in existence before and after their appearance in the tables and provide a key to the C4ISR expertise. Electronic warfare, which is essentially counter-command and control warfare, was only listed in the table because of flying electronic warfare units. However, highlighting the importance placed on combating enemy command and control systems indirectly indicates the importance of C4ISR to one's own efforts.

Throughout the entire USAF Statistical Digest history from 1947 through FY2003, satellite control, communications and a variety of operational and operational support ground-based squadrons were never mentioned. It is as if these missions were never part of the Air Force or at least not important enough to be mentioned in any breakdown of combat and combat support squadrons by mission area. They may have been excluded because they were seen as providing purely support functions, somewhat akin to the maintenance squadrons that were never counted. Of course, there is a difference between the space missions and maintenance support. For example, reconnaissance satellites do the same work as reconnaissance aircraft, whose units were consistently included in the USAF Statistical Digest. One might be tempted to argue that ignorance, or a sense of secrecy might also account for the exclusion of space units. However, the table immediately following the "AF Squadrons by Mission Area" table is invariably the "Aircraft & Missile Procurement" table, which frequently contains

information on ICBM, space launch vehicles, or satellite procurement.<sup>100</sup> The information was clearly available. It simply was not included. It is also possible that the officer corps somehow considered ground-launched and ground-controlled satellites to be somehow non-flying even though ICBMs, tactical surface-to-surface missiles and SAMs were included in the table until the mid 1990s. In any event, it is noteworthy that the Air Force devotes so much coverage to the largely flying-based fields of strategic offense, tactical, and strategic airlift in which it has no jurisdictional monopolies. By comparison, air defense and its byproducts of command and control and space get short shrift. A reading of the USAF Statistical Digest series for the Air Force officer corps' fields of expertise yields the conclusion that C4ISR does not appear to be the foundation for any Air Force jurisdictional claim, and space, where the Air Force has a near monopoly jurisdiction, is nonexistent.

#### Squadrons as Indicators of Changing Jurisdictional Claims

Since the reporting on Air Force functional missions is obviously skewed, it is necessary to examine other, more complete data sets to better document the changing nature of jurisdiction and the increasing importance of C4ISR within the Air Force

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<sup>100</sup> For example, the USAF Statistical Digest series in the early to mid-1990s contain a listing for the MX Peacekeeper ICBM, and the FY1998 issue contains procurement information on "Global Positioning (SPACE), Defense Support Program (SPACE), and Medium Launch Vehicle (SPACE). See Assistant Secretary of the Air Force (Financial Management and Comptroller of the Air Force), Deputy Assistant Secretary (Cost and Economics), United States Air Force Statistical Digest Fiscal Year 1993 (Washington: Assistant Secretary of the Air Force, 1994) E-103; and Assistant Secretary of the Air Force (Financial Management and Comptroller of the Air Force), Deputy Assistant Secretary (Cost and Economics), United States Air Force Statistical Digest Fiscal Year 1998 (Washington: Assistant Secretary of the Air Force, 1999) 94.

officer corps. We can stay with squadrons, but switch the focus from the categorization of squadrons to the numbers of squadrons assigned to particular work to gauge that the relative weight of effort that the Air Force officer corps assigns to different fields. The basic USAF Statistical Digest data reveals several trends that mirror our discussion in this chapter. See Chart 4-1 (Strategic Offense, Strategic Defense, Tactical, and Strategic Airlift Amalgamated “Flying” Squadrons based on USAF Statistical Digest Series Reporting). First, it is clear that the weight of effort in terms of squadrons has shifted over time between the four amalgamated categories of Strategic Offense, Strategic Defense, Tactical, and Strategic Airlift.

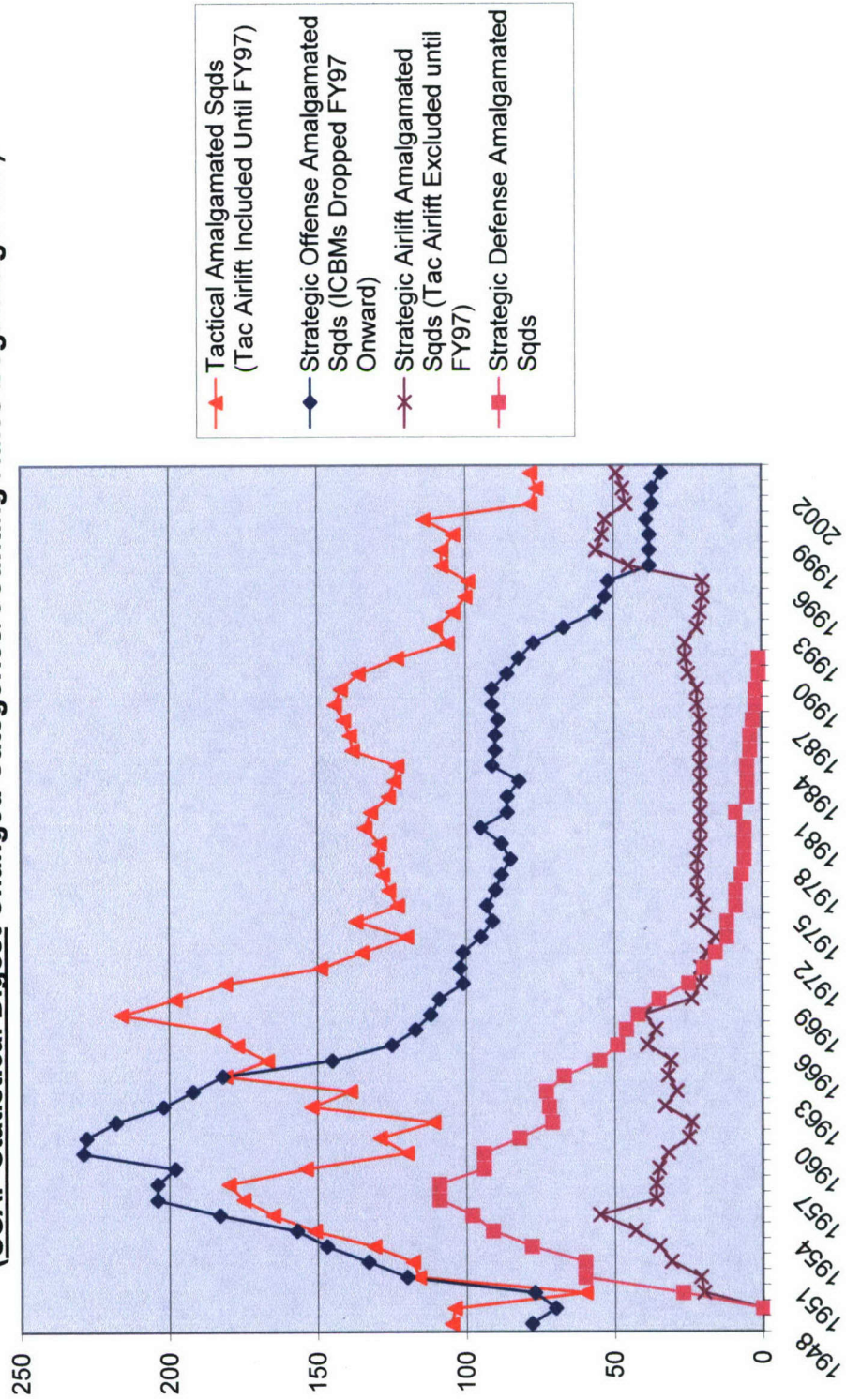
Strategic Offense squadrons, climbed steadily in numbers from FY1949 through FY1959, at which time they were the clear emphasis in terms of the number of squadrons allocated to the work. However, the number of Strategic Offense squadrons then began a relatively steady decline, which roughly coincides with the introduction of strategic missiles, (which are included in the squadron count). The number of Strategic Offense squadrons was overtaken by the number of Tactical squadrons by FY1965. The number of Tactical squadrons declined in FY1950 partly because of the general post-World War II drawdown, but also because forces were siphoned off to create the rapidly growing Strategic Defense squadrons. The number of Tactical squadrons then began to increase dramatically in response to the Korean War and continued with Cold War growth until FY1957, when it began a steep decline until FY1961. This was followed by another steep build-up, which peaked during the Vietnam War in FY1968,



**Chart 4-1: Strategic Defense, Strategic Defense, Tactical, and Strategic Airlift Amalgamated "Flying" Squadrons based on USAF Statistical Digest Series**

**Reporting**

**(USAF Statistical Digest Changed Categories/Counting Rules Beginning FY97)**



followed by another sharp decline through FY1973, when it bounced back a bit and settled into a new Cold War level. The number of Tactical squadrons climbed again in the mid-1980s, but declined as the Cold War ended. The number of Tactical squadrons settled out in the late 1990s, but they remained the highest proportion of squadrons per jurisdiction from FY1965 through FY2003. The number of Strategic Defense squadrons climbed quickly from FY1950, peaked in FY1957/58, and then declined in numbers as the ICBM age began. The fighter-interceptor force was useless against Soviet ICBMs, and the mission was eventually passed to the reserve forces. Strategic (long-range) Airlift squadrons follow the general Air Force trend of rapid growth into the mid-1950s, followed by a partial decline. The number of Strategic Airlift squadrons made a brief recovery during the Vietnam War, with a decline in the aftermath of Vietnam, before settling into a remarkably stable level through FY1997 when the USAF Statistical Digest stopped making a distinction between tactical and strategic airlift. The new counting rules led to a new leveling from the late 1990s to FY2003. The table indicates that the number of Airlift squadrons surpassed the number of Strategic Offense squadrons in FY1997, but this is somewhat misleading since the USAF Statistical Digest dropped ICBM squadron reporting in the same year, which accounts for the drop in the number of Strategic Offense squadrons. The number of Strategic Airlift squadrons overtook the number of Strategic Defense squadrons in the early 1970s and settled into clear third-place status until the FY1997 recounting procedures come into effect.

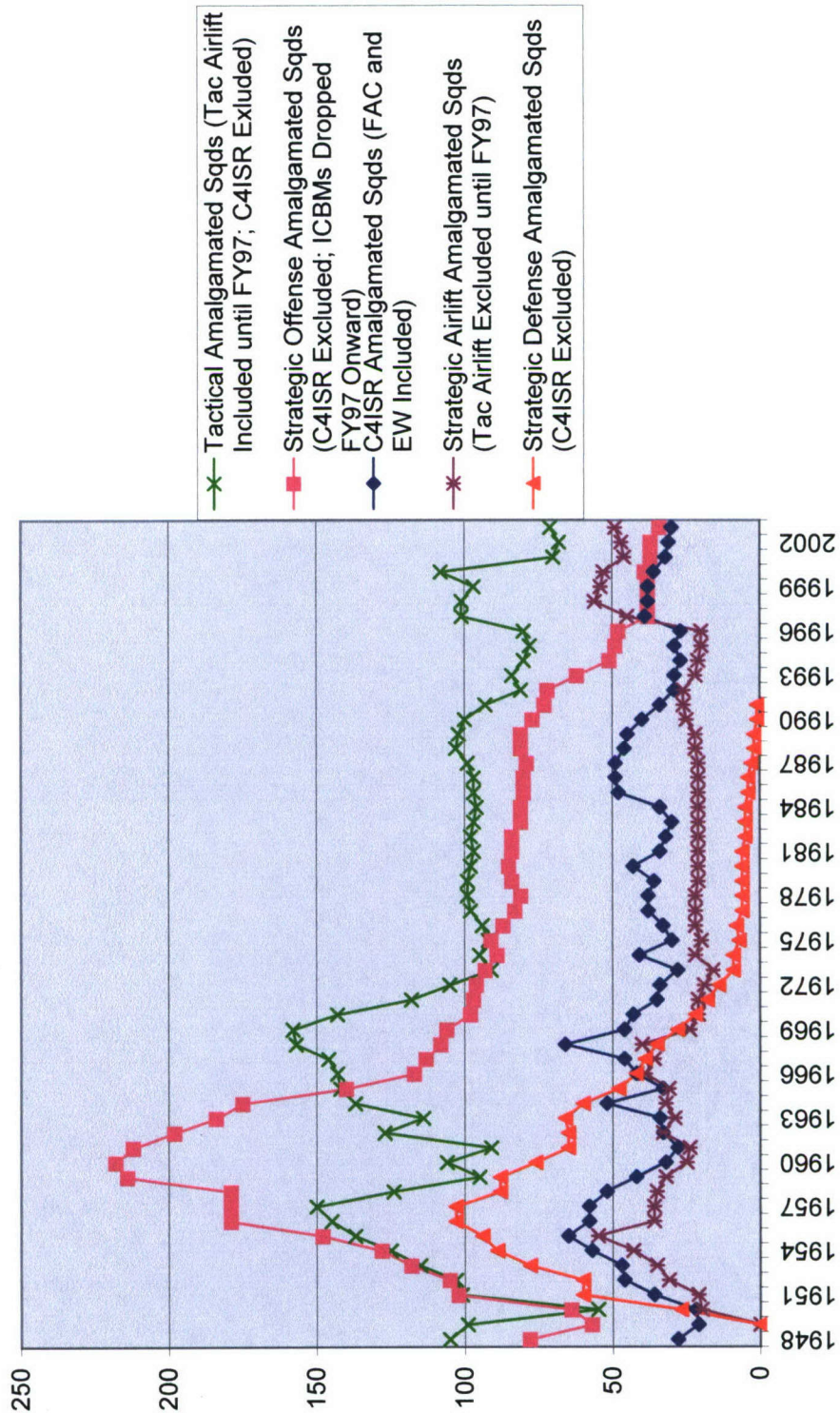


That depicts the story as told in the USAF Statistical Digest series, using its categories of jurisdiction. However, using the same data, but removing all of the command and control—including the FAC flying squadrons—as well as the intelligence, reconnaissance, and electronic warfare squadrons and combining them into one new amalgamated C4ISR expertise, reveals new trends. See Chart 4-2 (Comparison of Strategic Offense, Strategic Defense, Tactical, Strategic Airlift, and C4ISR Amalgamated “Flying” Squadrons (C4ISR Squadrons Removed From Other Categories)). First of all, the number of squadrons in the C4ISR amalgamation is equal to or greater than the number of Strategic Airlift squadrons from 1948 through the change in categories and counting rules in FY1997. Consequently, C4ISR appears to be historically at least as important as Strategic Airlift. The change in table classification and counting rules in FY1997 also creates the impression that the number of C4ISR squadrons is roughly equal to that of Strategic Offense, at least when ground-based ICBM squadrons are excluded. Furthermore, switching to percentages instead of raw numbers of squadrons shows that the relative weight of the C4ISR expertise in terms of squadrons has an overall positive growth trend since its nadir in the early 1960s. See Chart 4-3 (Comparison of Strategic Offense, Strategic Defense, Tactical, Strategic Airlift and C4ISR Amalgamated “Flying” Squadrons by Percent FY48-96).

Since we know that the data in the USAF Statistical Digest and the USAF Summary series’ listings of Air Force squadrons by mission area excluded space

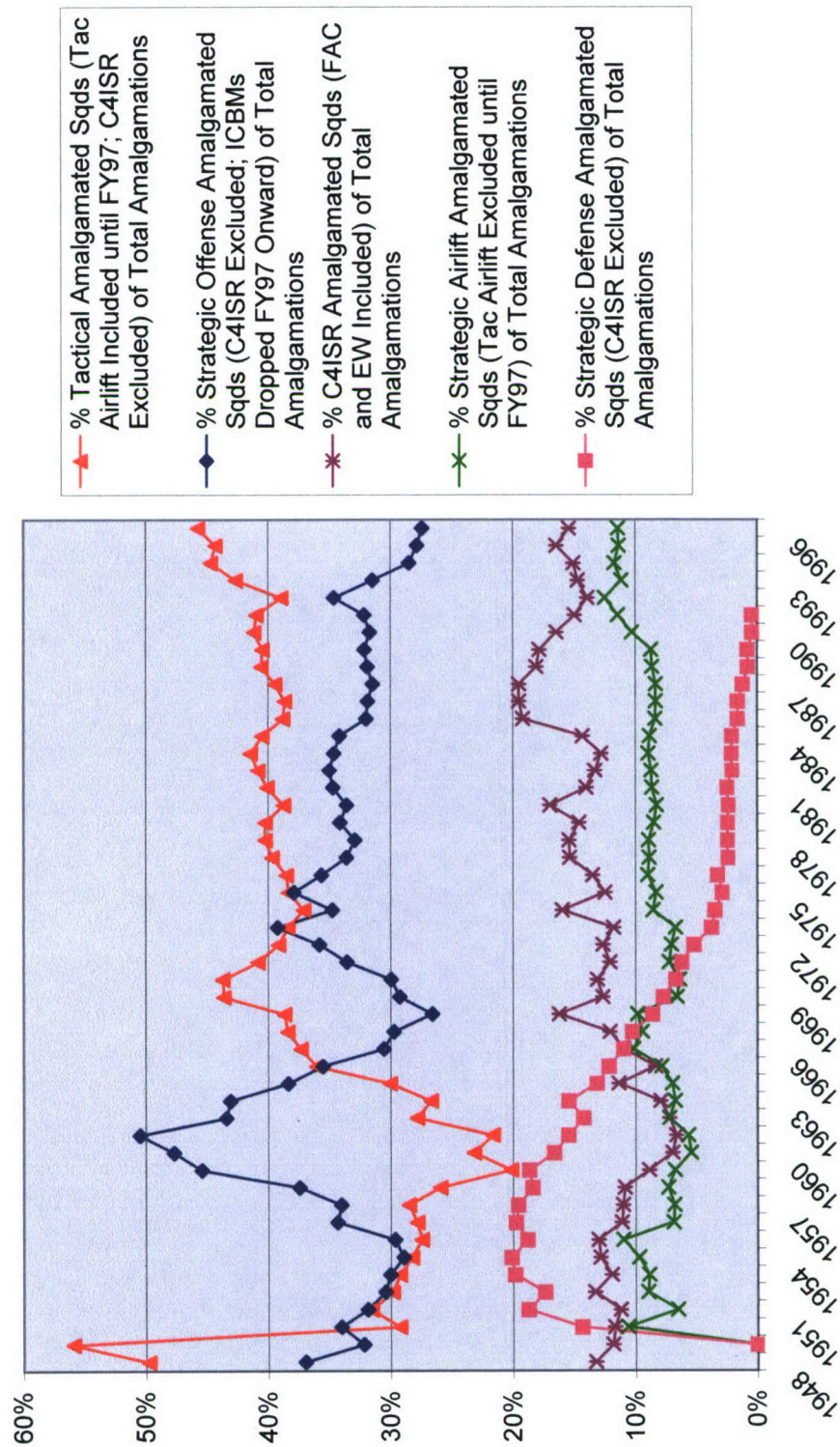


**Chart 4-2: Comparison of Strategic Offense, Strategic Defense, Tactical, Strategic Airlift, and C4ISR Amalgamated "Flying" Squadrons (C4ISR Squadrons Removed From Other Categories)**  
**(USAF Statistical Digest Changed Categories/Counting Rules Beginning FY97)**



**Chart 4-3: Comparison of Strategic Offense, Strategic Defense, Tactical, Strategic Airlift and C4ISR Amalgamated "Flying" Squadrons by Percent FY48-96**

**(USAF Statistical Digest Changed Categories/Counting Rules Beginning FY97)**





squadrons entirely as well as large parts of ground-based command and control units, we can use data from Air Force Magazine's annual Air Force Almanac editions to fill in some of these gaps.<sup>101</sup> Air Force Magazine includes space units as well as ground-based command and control squadrons. As in the USAF Statistical Digest, these are the only non-flying, non-missile squadrons included. Air Force Magazine includes the ICBM squadrons for the duration of its reporting, and they are counted in the Strategic Offense amalgamation. In addition, Air Force Magazine reports Ground-Launched Cruise Missile (GLCM) units in the 1980s, which are counted in the Tactical amalgamation. Since Air Force Magazine uses slightly different categories, we will first compare the USAF Statistical Digest and Air Force Magazine data without including space. The chart based on the Air Force Magazine data is very similar to the previous chart based on the USAF Statistical Digest data.<sup>102</sup> See Chart 4-4 (Comparison of Strategic Offense, Strategic Defense, Tactical, Strategic Airlift, and C4ISR Amalgamated Squadrons Reported in Air Force Magazine by Percent). Air Force Magazine reports about the same percentages for Tactical and Strategic Offense as the USAF Statistical Digest for the overlapping years of coverage. However, AF Magazine reports different percentages for C4ISR and Strategic Airlift. Whereas the USAF Statistical Digest data yields a C4ISR amalgamation that exceeds Strategic

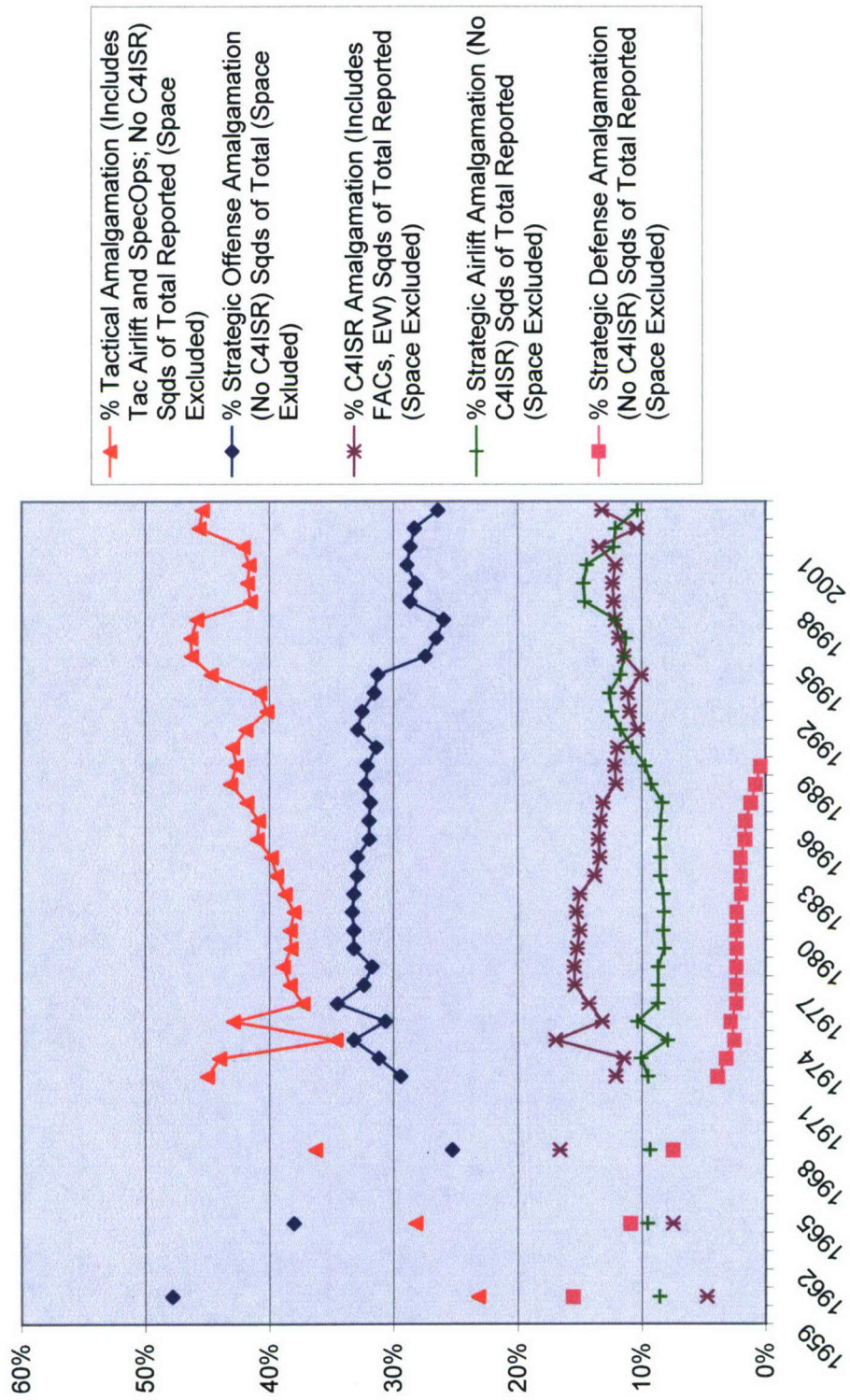
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<sup>101</sup> Air Force Magazine's annual Air Force Almanac edition has contained a similar list of Air Force active-duty "flying" squadrons by mission type since the early 1970s. It also occasionally provided back-data for specific years.

<sup>102</sup> Although the FY1997 USAF Statistical Digest change in categories and counting procedures makes it impossible to compare the FY1997 and later data with prior data, it is possible to see trends, which are similar to those based on the pre-FY1997 USAF Statistical Digest data, in Air Force Magazine data.



**Chart 4-4: Comparison of Strategic Offense, Strategic Defense, Tactical, Strategic Airlift, and C4ISR Amalgamated Squadrons Reported in Air Force Magazine by Percent**



Airlift squadrons for the duration of the overlapping years, the Air Force Magazine data yields several periods during which Strategic Airlift squadrons outnumber C4ISR squadrons.<sup>103</sup> Nevertheless, the Air Force Magazine data still supports the argument that C4ISR is at least as important a jurisdiction as Strategic Airlift in terms of Air Force squadrons allocated to the task.

Air Force Magazine reporting is also important because it includes information on space squadrons, reaching back into the late 1980s. Adding this data provides further insights on Air Force officer corps' jurisdictional claims. Dividing space squadrons into "operations" (space operations, launch, control, and aggressor

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<sup>103</sup> Neither the USAF Statistical Digest nor Air Force Magazine clearly list what types of squadrons are included in each specific squadron category, and both frequently rename categories, but it is relatively easy to continue the data trail despite the name changes until the FY1997 USAF Statistical Digest. However, the difference in the C4ISR numbers after the mid-1990s appears to be at least partly accounted for in differences of the placement of special operations squadrons. For example, Air Force Magazine lists 1 Strategic Command & Control, 4 Reconnaissance, 3 Electronic Warfare, 5 Tactical Air Command and Control (Ground-based) and 7 Tactical Air Control (FAC) squadrons for a total of 20 C4ISR squadrons in FY96. The USAF Statistical Digest lists 1 Strategic Command & Control, 3 Strategic Reconnaissance, 3 Electronic Warfare, 7 Tactical Air Support (OA-10), 2 Air Operations Centers (Formerly TACC), and 6 Air Control Squadrons (Ground-based) for a total of 22 C4ISR squadrons for FY96. Although these numbers are close enough, given the vagaries of determining what exactly to count, neither list appears to include the airborne AWACS or ABCCC squadrons. When the USAF Statistical Digest changes its categories and counting in FY97, the historical data provided for FY96 lists 31 Reconnaissance squadrons and 9 "Others" squadrons, which appear to be mostly FAC squadrons, for a total of 40 C4ISR squadrons. Although there is no list of the exact squadrons in the category, the USAF Statistical Digest includes breakdowns of the Air Force's Total Aircraft Inventory (TAI) for Reconnaissance, in which it includes among others 79EC-130s (53 of which turn out to be MC-130s in FY97), 35 EC-135s, 32 E-3s, 4 E-4s, 37 EF-111s, 1 E-8, 36 U-2s and no RC-135s (but 19 show up in FY97). Under "Other" the TAI lists 92 OA-10s and 2 OC-135s. This yields over 300 aircraft. Air Force Magazine also provides a TAI, listing 37 EF-111s, 92 OA-10s, and 137 "Reconnaissance/Battle Management/C3/I" aircraft for a total of 266 aircraft. Air Force Magazine, however, only puts 22 EC-130s into the Reconnaissance/Battle Management/C3/I category. It places 53 MC-130s in its Special Operations Forces Category, which the USAF Statistical Digest drops in FY97. This largely accounts for the difference, although Air Force Magazine also includes 19 RC-135s, which the USAF Statistical Digest does not report, in the Reconnaissance/Battle Management/C3/I category. When reported prior to FY97, I have included special operations squadrons in the Tactical amalgamation.

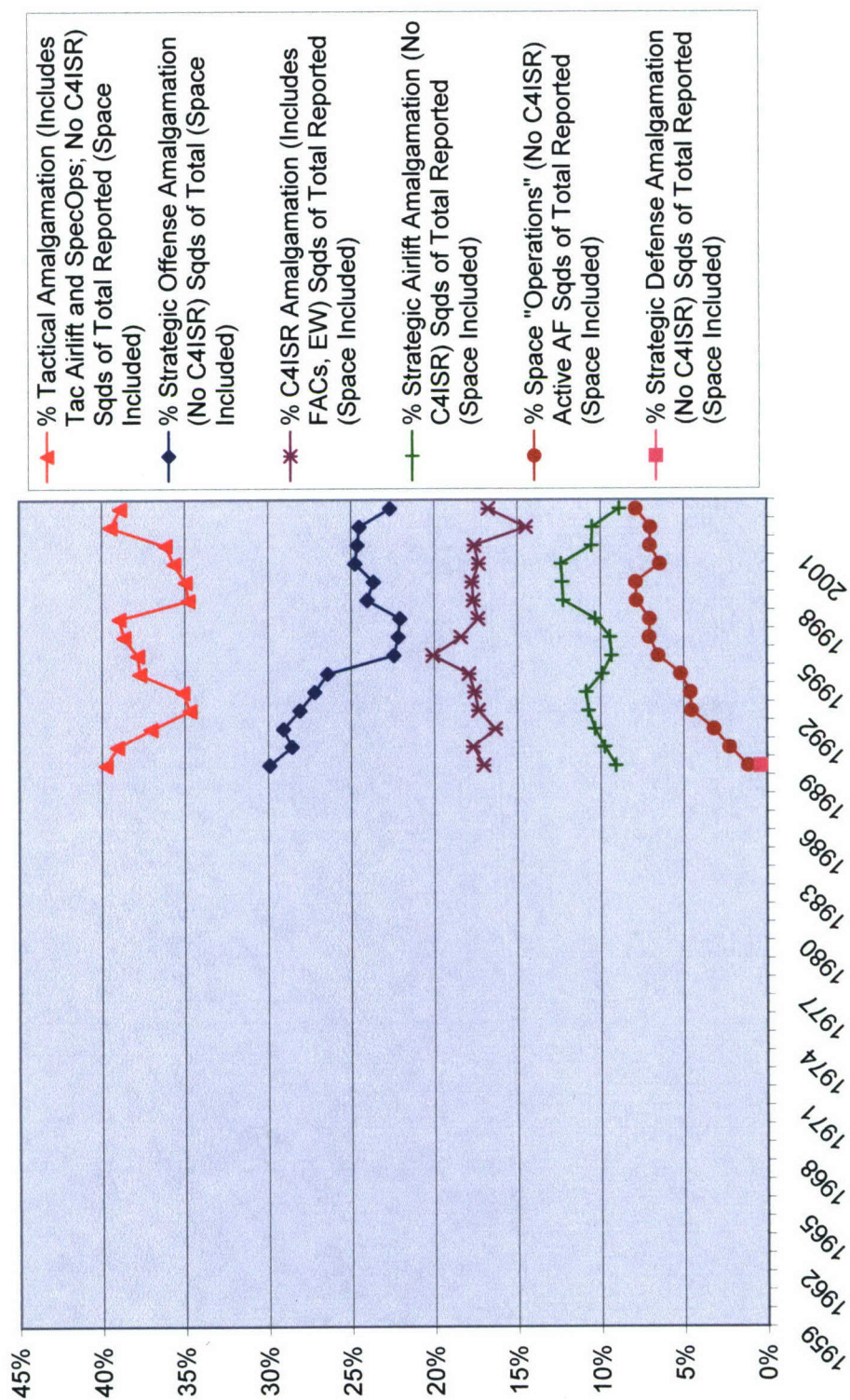


squadrons) and C4ISR (space communications, warning, and surveillance squadrons), then adding the information to the existing amalgamations based on Air Force Magazine data yields Chart 4-5 (Comparison of Strategic Offense, Strategic Defense, Tactical, Strategic Airlift, C4ISR and Space “Operations” Amalgamated Squadrons Reported in Air Force Magazine by Percent). When the space squadrons are added to the mix, two things become evident. First, when space C4ISR is added to the C4ISR squadrons, the total number of C4ISR squadrons clearly exceeds the number of Strategic Airlift squadrons for the duration of the reporting. Second, the number of squadrons in the Space “Operations” amalgamation is getting very close to the number of squadrons in the Strategic Airlift amalgamation. Space “Operations” is a visionary form of warfare for which the Air Force officer corps is seeking a monopoly jurisdiction.

The squadron data indicates that only Strategic Offense, Tactical, and Strategic Airlift remain out of the original Air Force jurisdictions. The number of Tactical squadrons has been on the ascent since roughly 1960 and Strategic Offense squadrons on the descent since then. The number of Tactical squadrons surpassed the number of Strategic Offense squadrons in FY1965. The number of Strategic Airlift squadrons has remained a distant third. However, when C4ISR and Space Operations are included as jurisdictions, the number of C4ISR squadrons is third, and the number of Space Operations squadrons rivals Strategic Airlift for fourth place. Consequently, in terms of the weight of effort as measured in the number of squadrons allocated, it is clear that



**Chart 4-5: Comparison of Strategic Offense, Strategic Defense, Tactical, Strategic Airlift, C4ISR and Space "Operations" Amalgamated Squadrons Reported in Air Force Magazine by Percent**



C4ISR and space operations, alone or together, are at least as important as Strategic Airlift to the Air Force officer corps. The USAF Statistical Digest series' exclusion of space squadron data presents a skewed, heroic warrior view of Air Force officer corps that does not reflect the real distribution of missions within the officer corps.

#### Aircraft as Indicators of Changing Jurisdictional Claims

It is also possible to look at the Air Force's aircraft for clues to the officer corps' changing jurisdictional claims, realizing that as in the preceding discussion, concentrating on aircraft largely ignores non-flying fields such as command and control, missiles, and space. Starting with a look at simple quantities of aircraft, it is apparent that active-duty Air Force total aircraft holdings peaked in the FY1956/1957 time period. See Chart 4-6 (Active-Duty Air Force Aircraft Inventory). Despite the Vietnam War, the total number of active (i.e., not in long-term storage) aircraft generally declined until FY 1976, when it leveled out until FY1989. The total number of active aircraft then declined again until hitting a new level in the mid-1990s. At first glance, the curve showing the number of pilots on flying status roughly parallels the curve showing the total number of Air Force active aircraft. See Chart 4-7 (Comparison of Total Pilots on Flying Status to Active Aircraft). However, an examination of the ratio of pilots on flying status to the active aircraft inventory shows a fair amount of fluctuation in the ratio, which ranges from 2.5 to over 4.5 pilots per aircraft. See Chart 4-8 (Ratios: Pilots and Navs on Flying Status per Active Aircraft Inventory). However, if one looks at total active-duty Air Force officers per aircraft, the pilot and navigator to



Chart 4-6: Active-Duty Air Force Aircraft Inventory per Fiscal Year

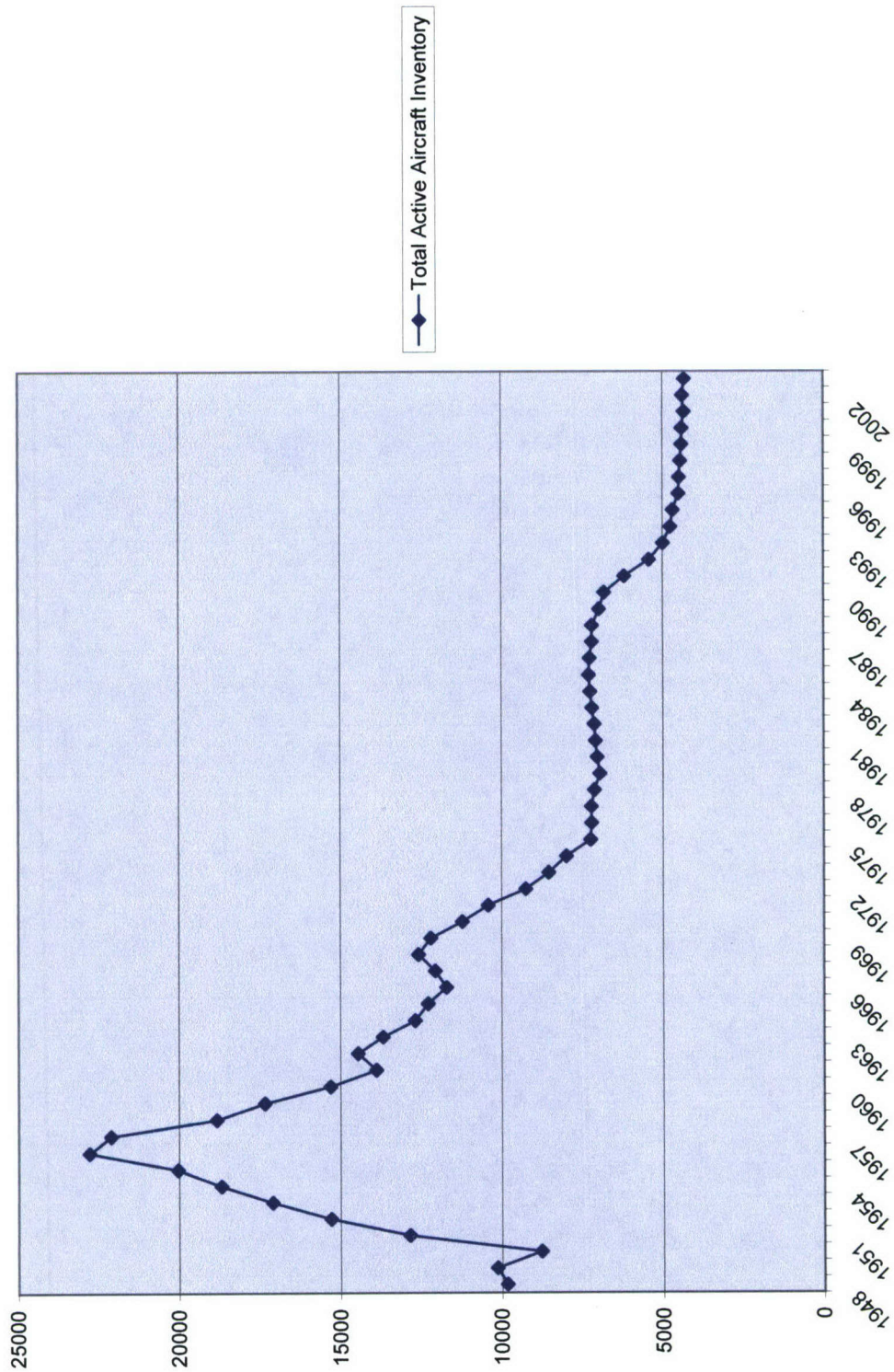




Chart 4-7: Comparison of Total Pilots on Flying Status to Active Aircraft

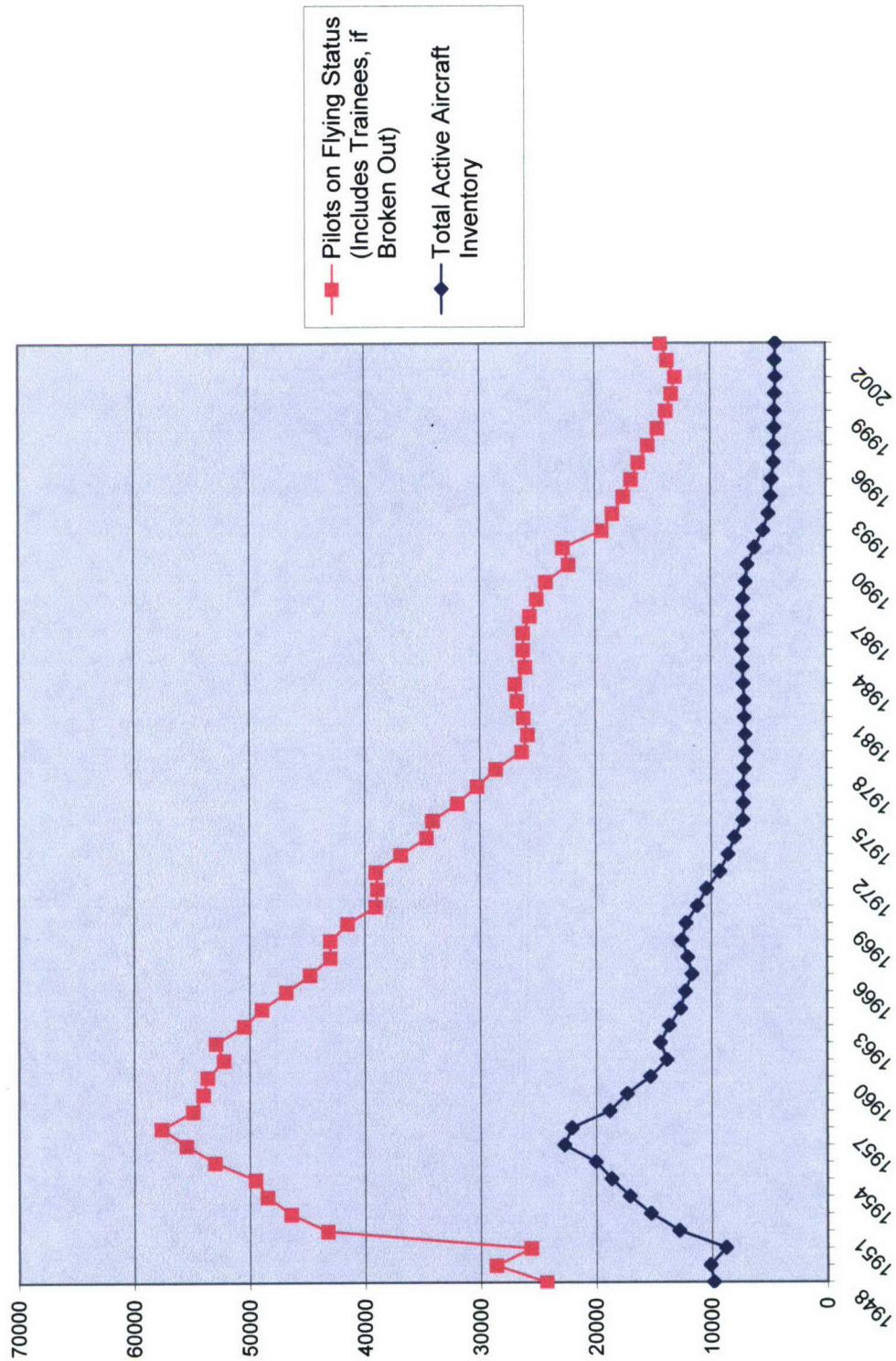
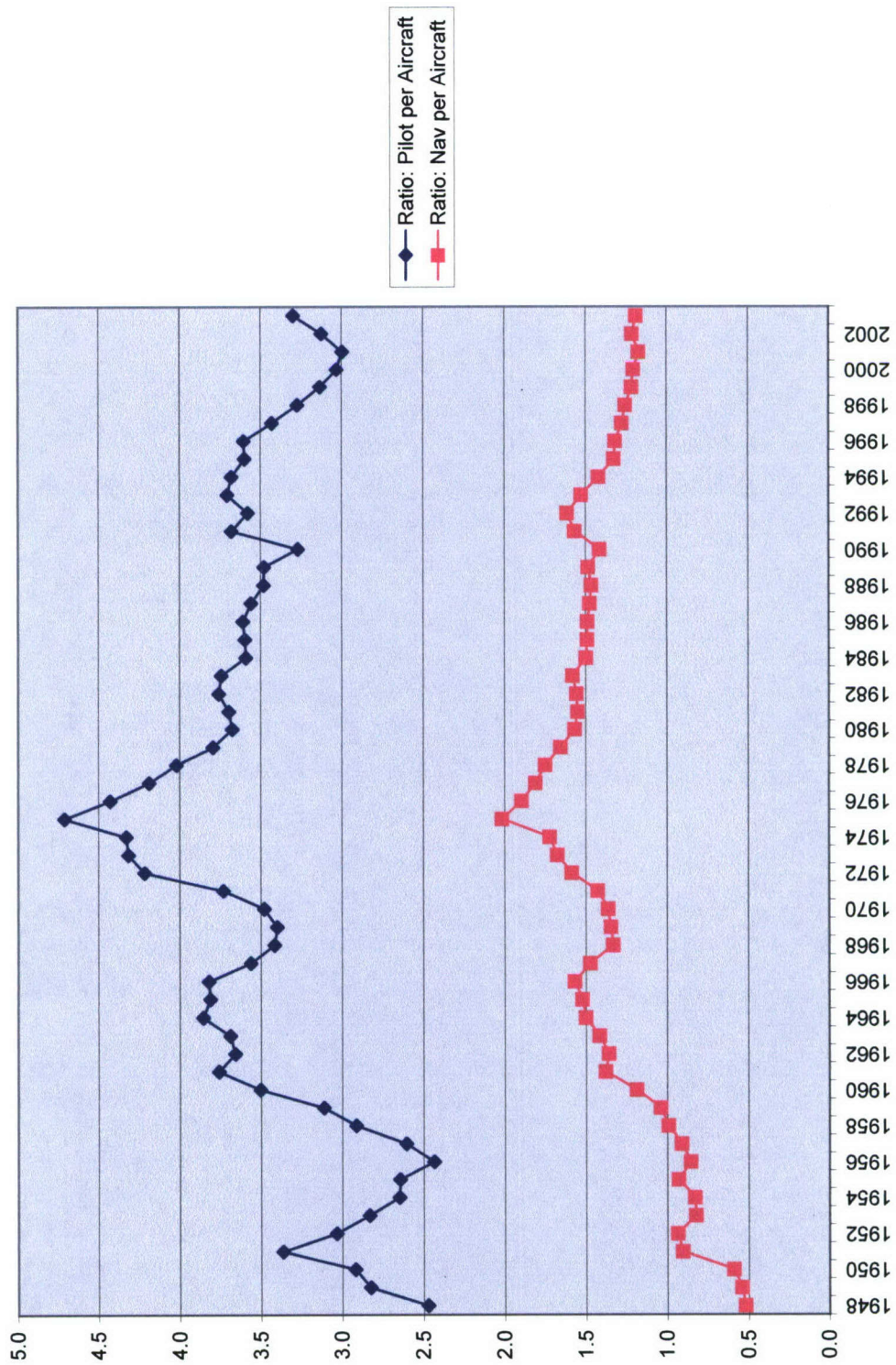


Chart 4-8: Ratios: Pilots and Navs on Flying Status per Active Aircraft Inventory

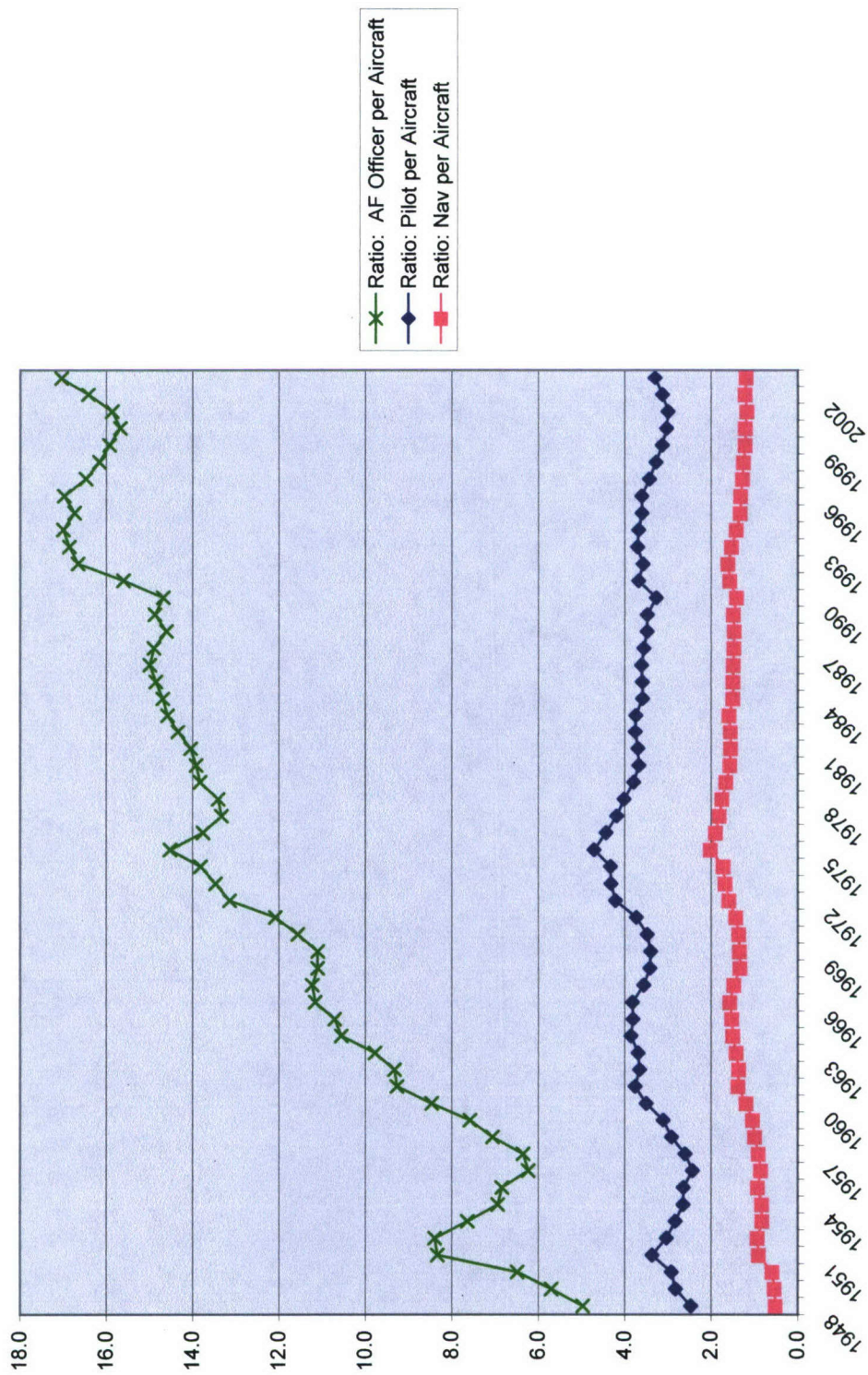




aircraft ratios are relatively flat in comparison. The graph of the ratio of total officers per aircraft indicates a relatively constant climb from approximately five officers per aircraft in FY1948 to over 16 in FY2003. See Chart 4-9 (Ratios: All Officers, Pilots on Flying Status, and Navs on Flying Status per Active Aircraft Inventory). This indicates a constant shift in the officer corps away from a general preoccupation with flying. Although this trend is similar to the overall decrease in the percentage of pilots in the officer corps, it is not quite the same thing since these charts introduce the number of aircraft into the equation. These charts indicate that on the one hand since the ratio of pilots per aircraft is relatively flat, as the number of aircraft in the inventory shrinks, the number of pilot officers also decreases; the number of pilot officers is tied to the number of aircraft. On the other hand, since the ratio of total officers per aircraft is increasing, the officer corps is consciously recruiting or retaining non-pilot officers out of proportion to the number of aircraft. These trends are interesting because general technological advancements such as computers would be assumed to reduce the need for raw numbers of officers across a variety of non-flying career fields like administration for example or perhaps even maintenance. Consequently, if the officer corps was not adding and changing its fields of work and expertise, one might expect the ratio of non-pilot officers per aircraft to actually decrease. This would of course, result in an increase in the percentage of pilots among the total officer corps. However, this is not the case. These non-pilot officers are a reflection of evolving and new fields of jurisdiction. Since aircraft data does not answer the question of what these officers



Chart 4-9: Ratios: All Officers, Pilots on Flying Status, and Navs on Flying Status  
per Active Aircraft Inventory



do, these personnel-related issues will be examined in greater detail in the chapters on corporateness.

In terms of the specific aircraft themselves, the USAF Statistical Digest series lists various types, which usually include bombers, tankers, fighters, reconnaissance, attack, cargo, trainer, helicopter, and a nebulous categorization of *other* aircraft. *Other* generally includes what over the years have been called communication, liaison, utility, and observation. Observation formerly implied FAC aircraft, but now also includes aircraft specially outfitted for monitoring the Open Skies Treaty. Furthermore, the Air Force has at times also maintained aircraft categories such as search and rescue, glider, amphibious and aerial target tow. Many of these categories can be further subdivided. Reconnaissance aircraft, for example, can be strategic, tactical, or electronic warfare reconnaissance. Given this complexity, amalgamation is once more in order.

However, two things quickly become apparent when one starts to amalgamate aircraft. First of all, the Air Force did not typically make a separate category for the (fighter-) interceptors used in Strategic Defense. They are already included in fighters, as are frequently attack aircraft. Consequently, in terms of aircraft, the Air Force officer corps does not recognize a separate fighter-interceptor, or Strategic Defense, category of work. Furthermore, there is a bit of a categorization problem with respect to attack aircraft since the single-seat A-7 and A-10 look like “fighters,” but the AC-130 gunship is a four-engine cargo aircraft modified to fire heavy weapons at targets on the ground. Nevertheless, it falls into the same category. However, its relatively small

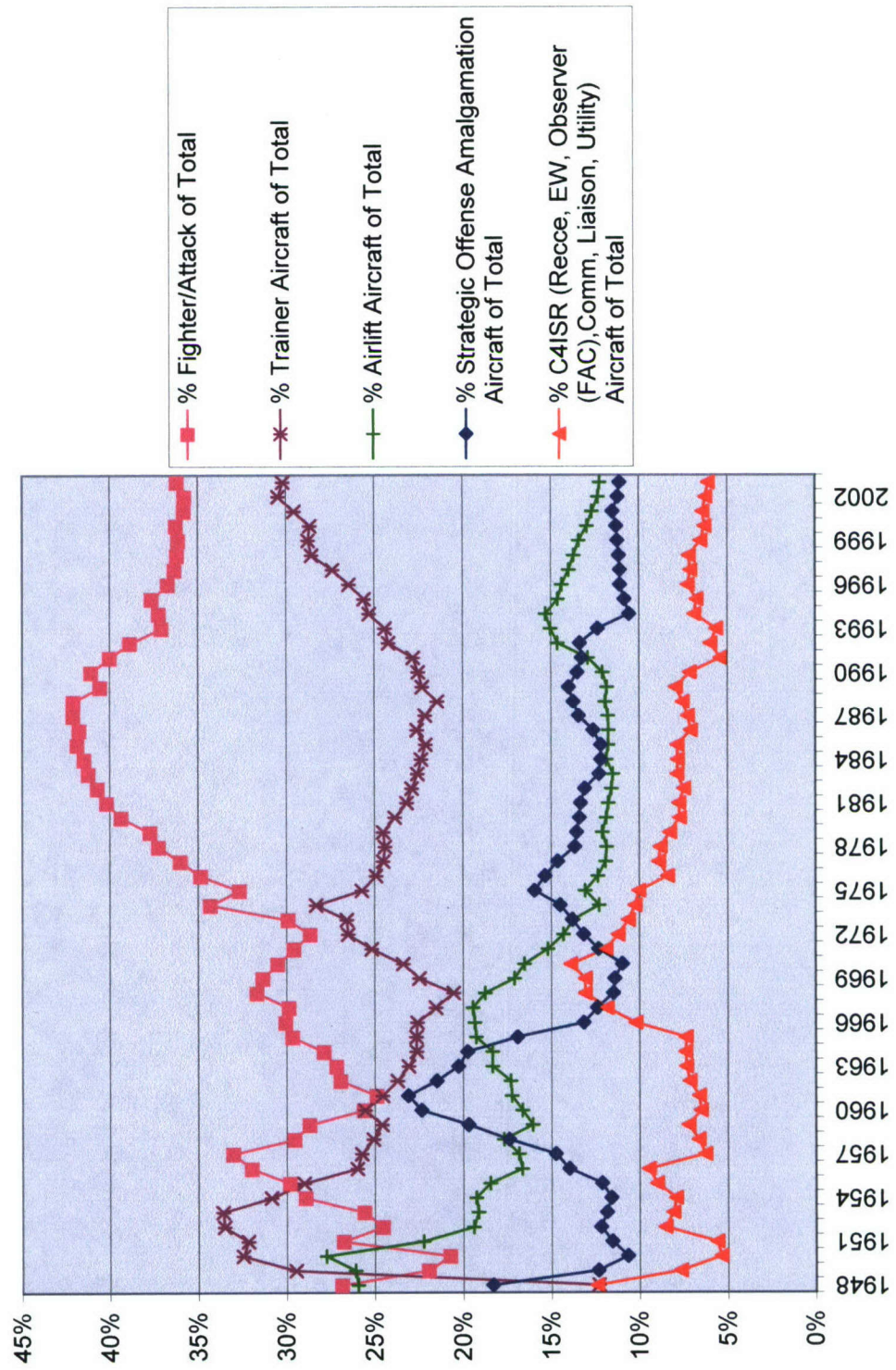


numbers have only minor impact on the Tactical amalgamation, which is simply Fighter/Attack aircraft. The second thing is that Trainer aircraft make up somewhere between 20%-33% of the total Air Force aircraft. Since the Trainer aircraft category typically is the first or second ranking amalgamation, this cannot simply be ignored. Consequently, the amalgamations for aircraft are: Fighter/Attack, Trainer, Airlift (strategic and tactical), Strategic Offense (bombers and tankers), and C4ISR, which includes reconnaissance, electronic warfare, observer (FAC) as well as communications, liaison and utility aircraft. The communications, liaison and utility aircraft are included with observer aircraft because the same types of aircraft are included under the various category headings in different years and it is difficult to break out the individual aircraft or missions in most years. The USAF Statistical Digest series does not include a separate category for command and control aircraft. At times they have been lumped under their basic aircraft types. For example, airborne early warning and control EC-121s were included without specific reference in the C-121 total and SAC's EC-135 command and control aircraft were hidden under the C-135 total under Cargo aircraft. The same occurs with special operations aircraft like the EC-130. Consequently, the Cargo totals are at times inflated to the detriment of the C4ISR numbers. After FY1996 command and control aircraft and special operations aircraft were generally tallied under reconnaissance.

The amalgamated aircraft numbers yield Chart 4-10 (Comparison of Quantities of Types of Aircraft by Percent). The dominance of the Fighter/Attack amalgamation



Chart 4-10: Comparison of Quantities of Types of Aircraft by Percent



over the other combat or operational types of aircraft is clear. The number of Strategic Offense aircraft only comes close in the late 1950s and the early 1960s. Instead, Strategic Offense appears locked in battle with Airlift for third place. The C4ISR amalgamation appears to be solidly in last place. Trainers, however, outnumber all categories but the Fighter/Attack, indicating a significant investment in flight training, which of course is the foundation of all Air Force flying activities. This can be seen from Chart 4-11 (Ratios: Fighter/Attack to Other Types of Aircraft). This chart shows that from FY1948 through FY2003, the ratio of Fighter/Attack to bombers has steadily climbed from 1.5 to just over 9 fighters per bomber. Tankers appear to have leveled out at the 5 fighters per tanker level, with C4ISR at about 6 fighters per C4ISR aircraft. The rate for Airlift aircraft has climbed, with minor fluctuations from approximately 1:1 in the Air Force's early years to a level of three fighters per Airlift aircraft in FY2003. Trainers have maintained a fairly constant 1:1 ratio with fighters. That and the total numbers of fighters and trainers leaves the impression that the contemporary Air Force is very much about fighter and trainer aircraft—small, relatively nimble, one or two-seat jet aircraft—not big and ponderous bombers, tankers, cargo, or command and control aircraft.

In addition to basic numbers, there are also qualitative issues involved with Air Force aircraft. For example, if one looks at bombers, one bomber, the B-52, stands out as dominating most of the independent Air Force's history. See Chart 4-12 (Number of Air Force Bombers by Type and Year). The B-52 was already a sizeable contributor by



Chart 4-11: Ratios: Fighter/Attack to Other Types of Aircraft

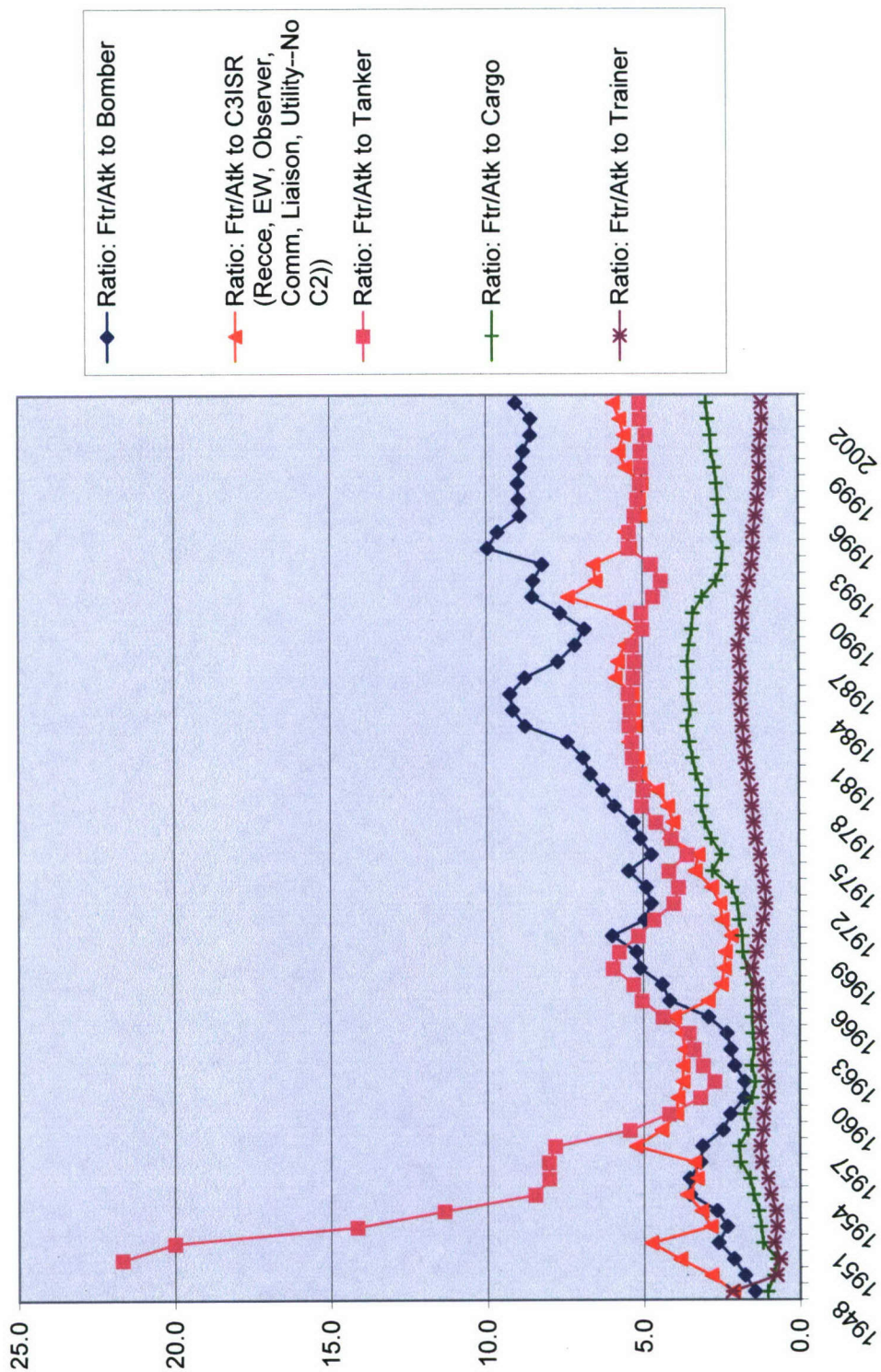
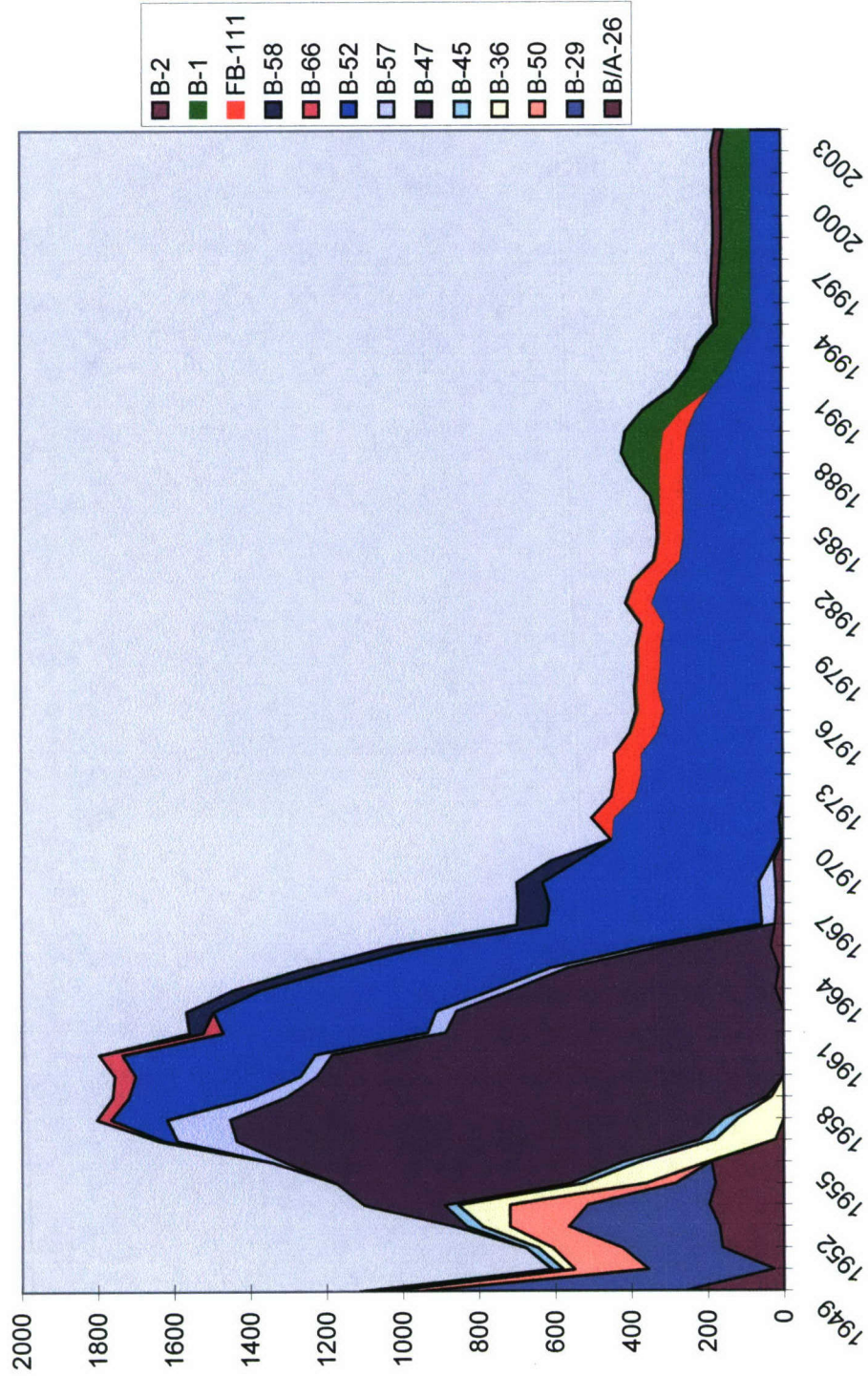




Chart 4-12: Number of Air Force Bombers by Type and Year



the late 1950s, and remained the top bomber in terms of numbers, as well as bomb loads and ranges too, from the late 1960s through 2003 and beyond. The B-52's long domination of the bomber world is indicative of a long-term shift in the Air Force officer corps' emphasis away from the manned bomber, supporting the jurisdiction of Strategic Defense, to the manned fighter, supporting the Tactical jurisdiction. A bomber cannot strike targets as quickly, as deeply and with the impunity of ICBMs. Consequently, new strategic bombers have been a hard sell to the American public. New bombers are extremely expensive, and the B-52 platform has proven to be very adaptable. The competition that the Air Force's manned bomber faces for jurisdictional dominance over Strategic Defense comes not from other bombers but from its own cruise missiles and ICBMs and the Navy's SLBMs. The Army and Navy officer corps both gave up any rights to strategic bombers in the series of inter-profession agreements that led to the Air Force's independence, as well in later agreements resolving jurisdictional disputes.<sup>104</sup> Furthermore, the SALT and START nuclear arms control agreements placed limits on the two Air Force legs (bombers and ICBMs) of the American nuclear triad.<sup>105</sup> Consequently, any bomber, old or new, arguably provides sufficient justification to maintain an Air Force bomber-based claim for a share of the Strategic Defense jurisdiction. Nevertheless, the Air Force has been able to continue to

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<sup>104</sup> See for example, Richard I. Wolf, The United States Air Force Basic Documents on Roles and Missions (Washington: Office of Air Force History, 1987).

<sup>105</sup> Navy SLBMs form the third leg of the nuclear triad.



sell the need for a manned strategic bomber and procure limited numbers B-1s and B-2s.

In addition, there has been a general blurring of the once clearly distinct *strategic* and *tactical* realms. This blurring is the result of improved, more bomber-like fighters with respect to combat radius and bomb loads on the one hand, and the ability of the Air Force's ability to achieve air supremacy so that bombers can be used in tactical roles without undue fear of losses on the other.<sup>106</sup> The post Cold War and post 9-11 world offered opportunities for bombers in tactical, non-nuclear war. Bombers still can carry larger ordnance loads further, but they have also become more fighter-like by carrying precision-guided munitions (PGMs), which shift the emphasis away from simple tons of bombs to the number of targets that can accurately be attacked per sortie. Culturally, the B-52 crew of six shrinks to four in the B-1 and to two in the B-2. In addition, the B-1 image of variable-wing and supersonic technology is quite fighter-like, and the B-2 with its stealth and flying-wing technology is certainly not reminiscent of an old bomber—the biggest box with wings feasible to carry the most fuel and bombs possible. To be useful, however, all bombers must be able to provide not only strategic attack, but a complementary role in the Tactical jurisdiction—specifically, in the blurred, non-nuclear, strategic/tactical air-to-ground area.

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<sup>106</sup> For example, F-15E bomb loads and ranges are loosely comparable those of the B-29 or B-47, which the B-52 replaced. An F-15E can carry up to 24,500 lbs of ordnance and has a ferry range of 3,500 miles with conformal fuel tanks. A B-29 could carry 20,000 lbs of bombs with a range of 3,250; and a B-47 could carry 22,000 lbs of bombs with a range of 3,600. See The Editors of *Air Force Magazine*, The Almanac of Airpower (New York: Simon & Schuster, 1989) 72, 185-186.



The tanker story is similar in some respects to the B-52 story since the KC-135 became operational in the late 1950s, eclipsed the earlier tankers by the mid-1960s, and then remained the Air Force's main tanker through FY2003 and beyond. See Chart 4-13 (Number of Tankers by Type and Year). However, the tanker story is not quite the same as that of the bombers. Tankers cannot simply be replaced by ever-more capable fighters. Although the KC-135 was originally tied to the B-52 intercontinental bombing mission, tankers have been instrumental in giving fighters the range to cause the blurring of tactical and strategic bombing. Furthermore, tankers no longer just service bombers and fighters. Today's Air Force tankers support cargo, reconnaissance, and command and control aircraft. In addition, the Air Force tankers provide the fuel to extend the ranges of Navy, Marine, and a host of allied aircraft in flying operations and exercises conducted with the Air Force. In fact, the Air Force has an almost monopoly in this jurisdiction—flying gas stations in the sky. Naval tankers are much more limited in range, speed, fuel offload, quantities of aircraft, and types of refueling connections. Outside of the US, few countries have more than a handful of big tanker aircraft. However, the long life of the KC-135 fleet, extended by modification and rejuvenation programs, is indicative of an apparent Air Force officer corps willingness to minimize investment in the supporting jurisdiction of air-to-air refueling. This could potentially

**Chart 4-13: Number of Tankers by Type and Year**

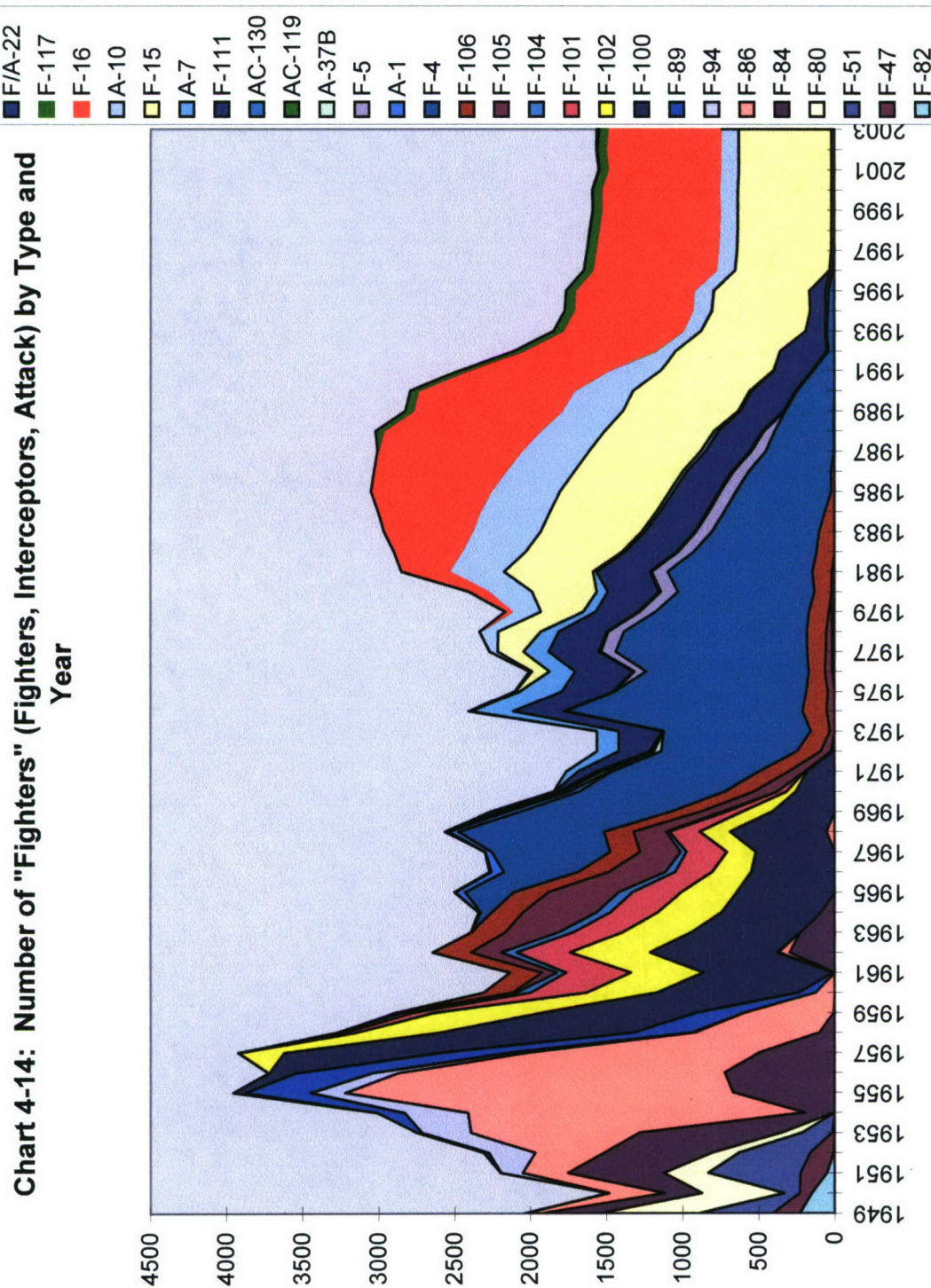


be the result of a perception that it is in a safe market position with its near monopoly holdings.

The story that fighter aircraft tell is quite different. See Chart 4-14 (Number of “Fighters” (Fighters, Interceptors, Attack) by Type and Year). Whereas a random vertical slice through the bomber graph might only hit two aircraft types and the same slice through the tanker graph might only touch the KC-135, a random vertical slice through the fighter chart would bisect several aircraft types. The Air Force not only has more fighters, it also has more types of fighters at any one time than other aircraft. In addition, the fighters do not stay in the inventory as long as the bombers and tankers. Consequently, current fighters are based on developments gained through more iterations of generational growth than the bombers and tankers. Although it could be argued that this is a product of cheaper investment and shoddier products, which require more frequent replacement, the better explanation is that the Air Force officer corps places a premium on possessing state of the art technology in fighter aircraft and their weapons systems. This also means that fighter pilots are more accustomed to changing technology in their workplace.

This is at least partly because competition is intense in the fighter world. First of all, Air Force fighters are competing with the other services for a slice of the Tactical jurisdiction. For example, Naval and Marine aircraft have participated in Desert Storm, the Balkan operations, and Operation Enduring Freedom and Operation Iraqi Freedom. These aircraft, flying from carriers or air bases, have capabilities comparable to the Air





Force fighters. Army helicopters compete with the Air Force fighters in the close-air-support expertise, and Army Tactical Missile System (ATACMS) and Navy Tomahawk Land Attack Missiles (TLAMs) compete with fighters for jurisdiction over deeper strikes. Naval and Army surface-to-air missile systems (SAMs) also compete with fighters for jurisdiction over portions of air defense. Furthermore, fighters compete directly with enemy aircraft and systems during times of conflict. Bombers do not compete with enemy bombers in head-to-head competition, nor do cargo aircraft. Instead bombers penetrate enemy airspace and fall prey primarily to enemy fighters and SAMs. Bomber crews can do little more than shake their fists at enemy bombers bound in the opposite direction. They have their bombs to drop on ground targets and electronic and infrared countermeasures equipment to protect them from enemy missiles, but no air-to-air missiles. Cargo aircraft typically fly over friendly territory and seek to avoid both enemy fighters and SAMs since they can do little more than run away and use more limited electronic and infrared countermeasures equipment. Fighters, however, hunt all enemy aircraft on both sides of the figurative border and must deal with enemy SAMs and antiaircraft artillery (AAA) in the border area and beyond as they attack aircraft or ground targets. At this level, however, competition is not over jurisdiction claims or market shares directly, but about survival. After survival, however, winning in an effective and efficient manner still is important because that provides the foundation for keeping or enlarging jurisdictional claims. Consequently, the high levels of competition against other services' aircraft and



systems, its own bombers, and enemy aircraft and systems results in a need for heavy Air Force investment in fighters simply to maintain its market share of the multifaceted Tactical jurisdiction.

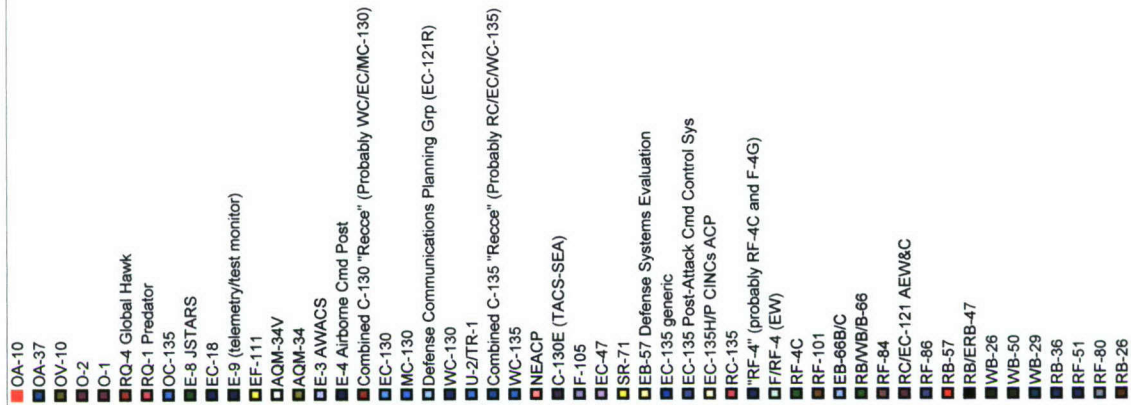
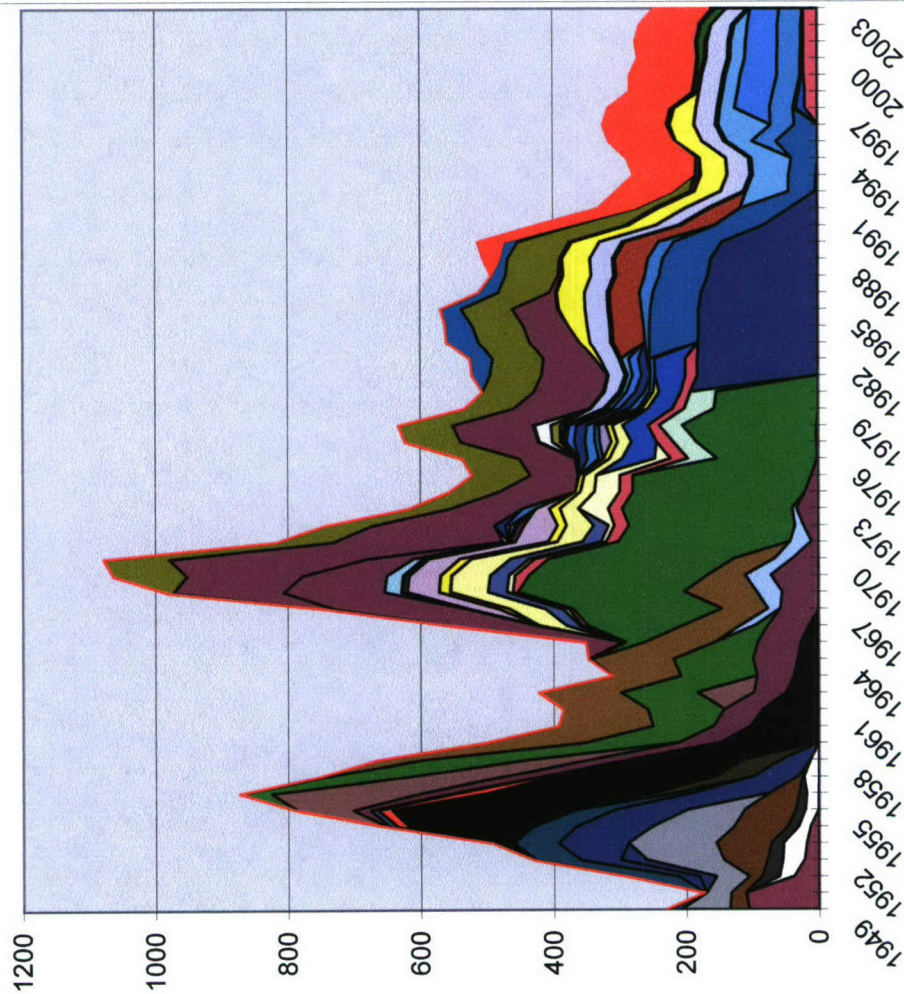
The Air Force's C4ISR aircraft are critical parts of the larger C4ISR complex that provides command and control over the entire air war. C4ISR is dependent on technology, and therefore, the graph of C4ISR aircraft resembles that of the fighters more than those of the bomber or cargo aircraft. See Chart 4-15 (Reconnaissance, Cmd and Control, Electronic Warfare, and FAC Aircraft by Type and Year). However, the C4ISR aircraft chart is unique in that it under-represents the C4ISR contribution because some of it has been transferred to space-based systems. Although one might make a similar case for bombers *vis a vis* ICBMs, none of the other aircraft missions have been transferred to space. The Air Force officer corps must keep space firmly within its professional bounds, or risk losing its near monopoly over the C4ISR jurisdiction. A loss of this monopoly would open the command and control of air operations to competition, which would undercut a major pillar of the modern Air Force officer corps' justification for an independent professional existence. Without modern C4ISR, the Air Force officer corps would be little more than a supplier of aircraft and crews.

#### Flying Hours as Indicators of Changing Jurisdictional Claims

Numbers and types of aircraft are not the only Air Force quantitative index that shows the evolution of a separate Air Force C4ISR expertise. Flying hours are another



**Chart 4-15: Reconnaissance, Command and Control, Electronic Warfare, and FAC Aircraft by Type and Year**



Air Force metric that provides similar data. In addition, it has the same caveats, since flying hours are tied to aircraft and exclude space and ground systems. See Chart 4-16 (Air Force Active-Duty Annual Flight Hours). In terms of overall flying hours, the chart shows the initial post-World War II levels, a sharp climb for Korea, followed by a slow decline during the 1950s Cold War years, and increase for Vietnam, followed by a gradual decrease to a new Cold War level from the mid-1970s through Desert Storm, followed by another drop to a rough post-Cold War level with a slight post-9-11 climb. Dividing total active-duty active flying hours by total active-duty active aircraft yields a slightly different presentation of the same story. Whereas total flying hours in FY2003 are less than a quarter of the Air Force's peak total flying hours in the mid-1950s, the flying hours per aircraft ratio shows considerably less variation, and clearer peaks for the Korean War, Vietnam, and Desert Storm, suggesting a total peacetime ratio in the 400 hours per aircraft range. See Chart 4-17 (Total Flying Hours per Active-Duty Active Aircraft per Year).

However, graphing the same information by aircraft types brings a level of variation for examination. See Chart 4-18 (Flying Hours per Aircraft Type per Year (FY73-FY75 Cargo Includes All Aircraft Based on Cargo-Type Model, e.g., KC-135, RC-135, EC-130, etc.)). First of all, it is clear that cargo aircraft consistently fly



Chart 4-16: Air Force Active-Duty Annual Flight Hours

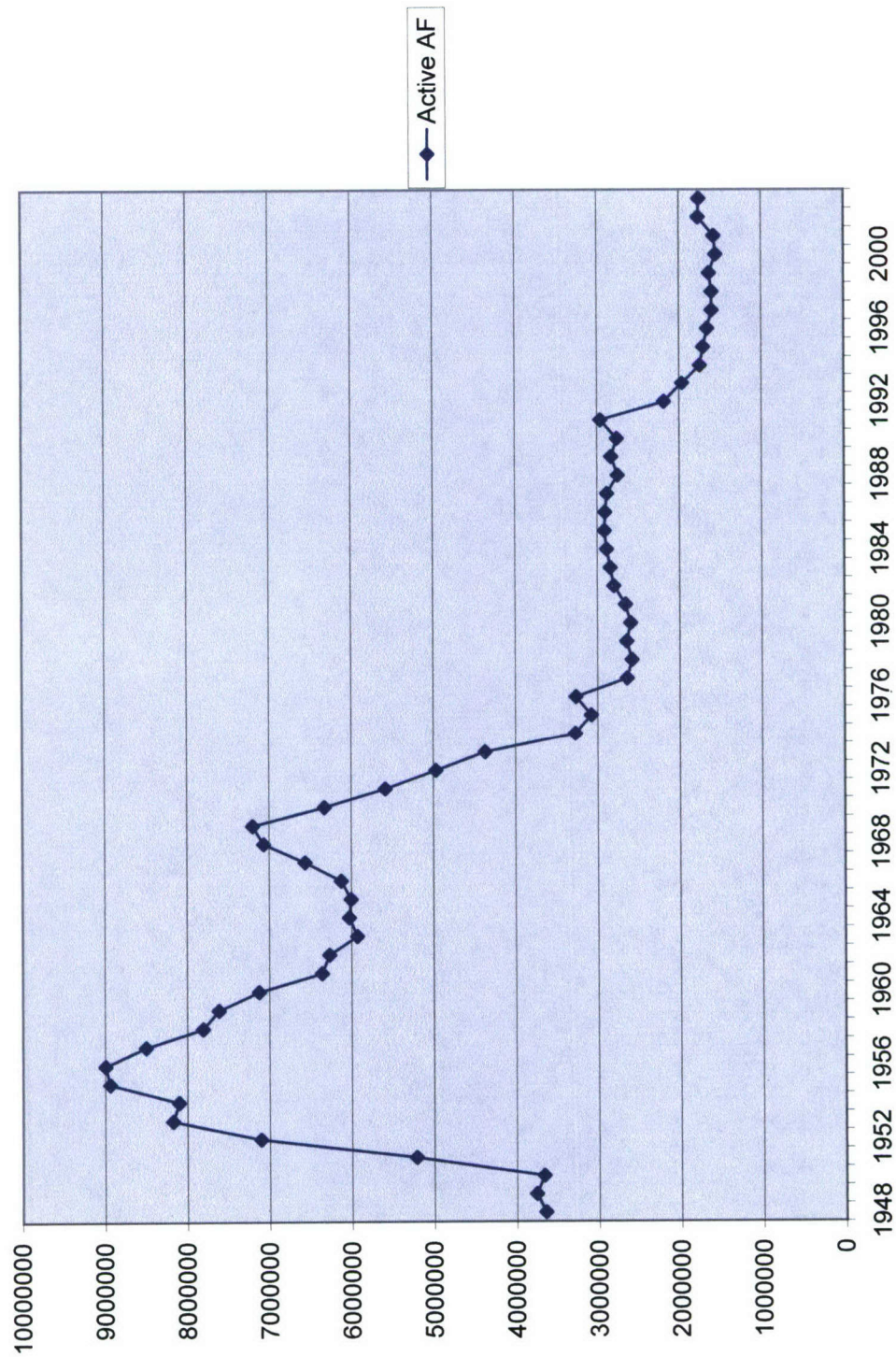




Chart 4-17: Total Flying Hours per Active-Duty Aircraft per Year

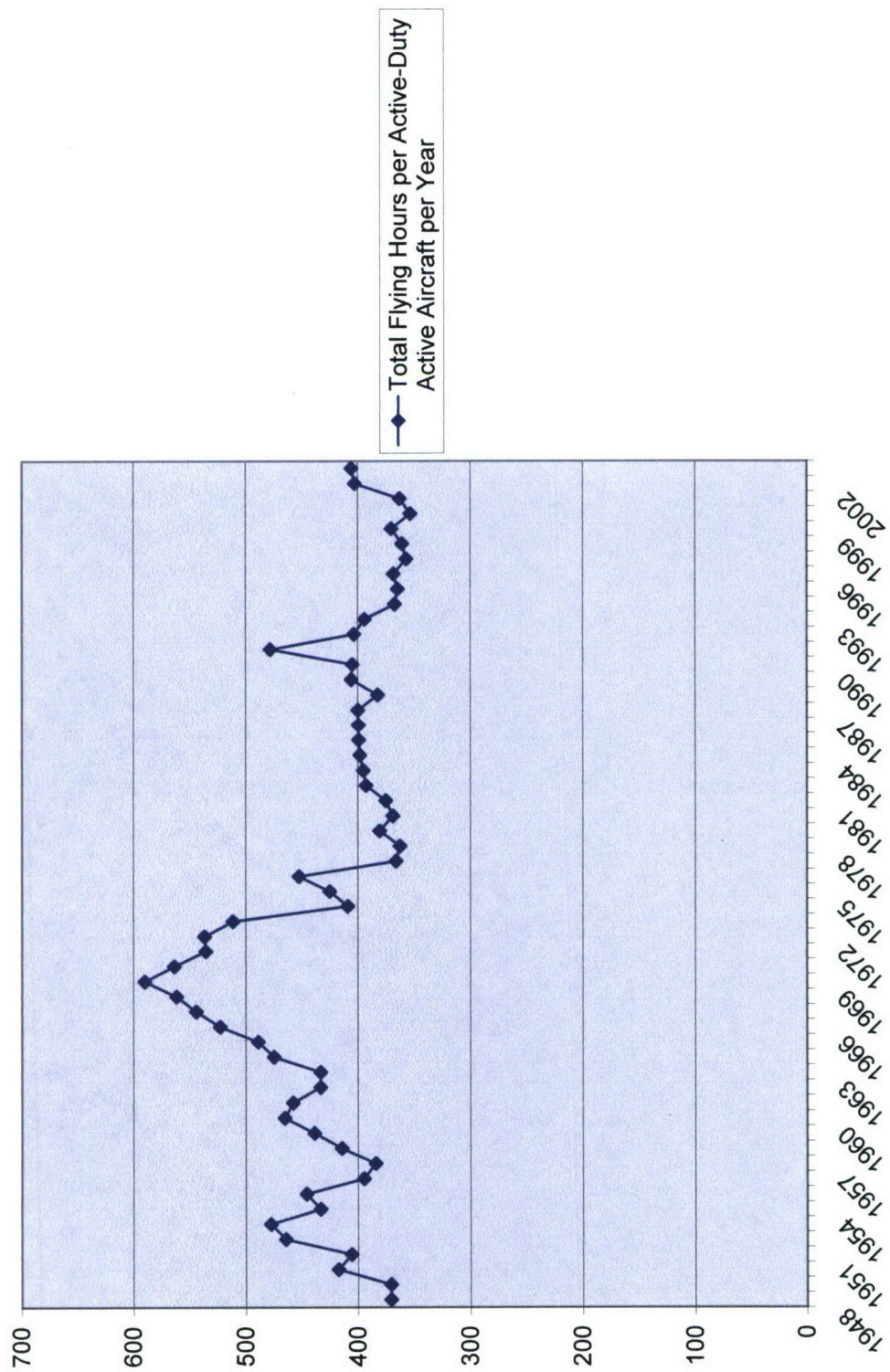
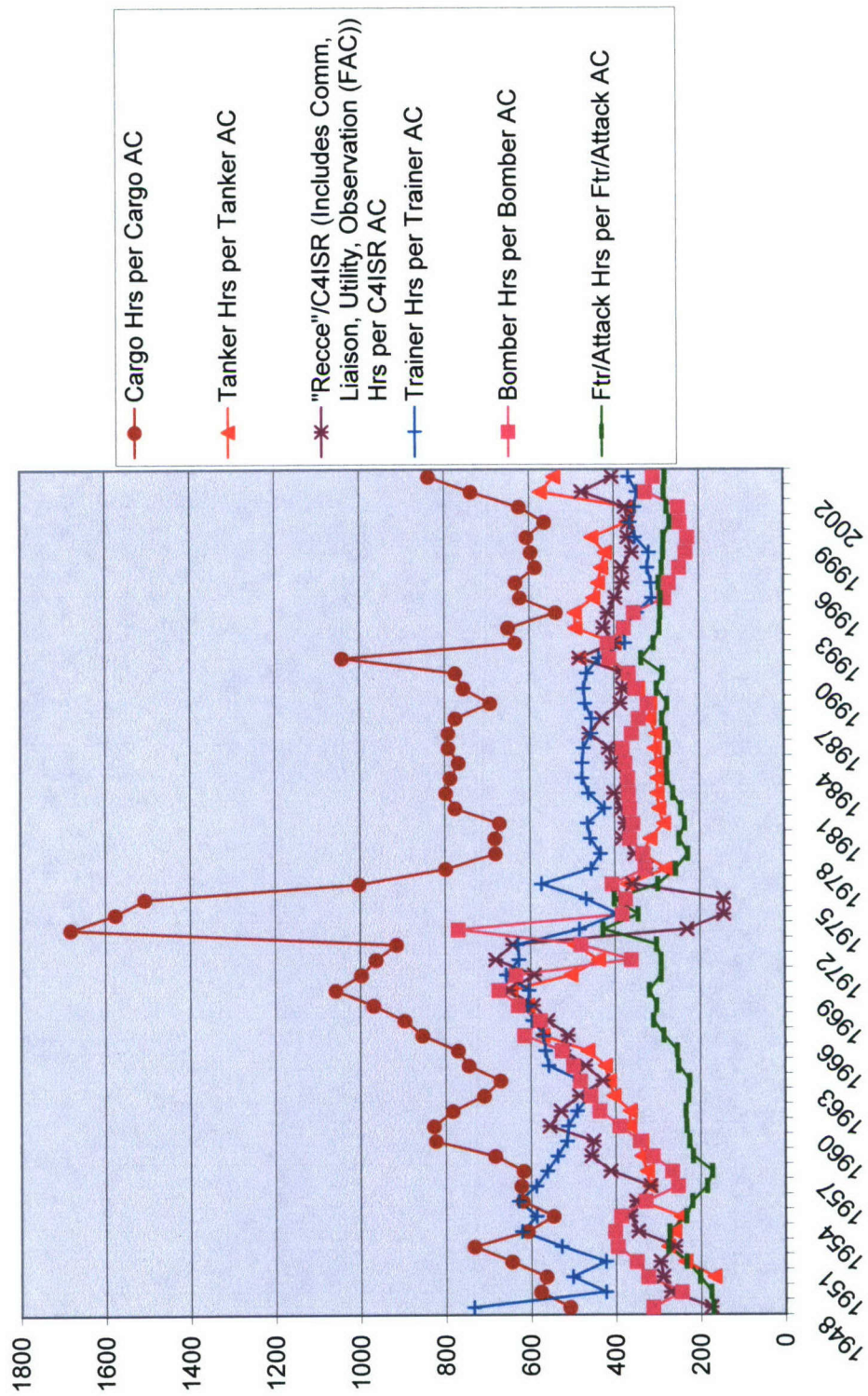


Chart 4-18: Flying Hours per Aircraft Type per Year  
(FY73-FY75 Cargo Includes All Aircraft Based on Cargo-Type Model,  
e.g., KC-135, RC-135, EC-130, etc.)





significantly more hours per aircraft than any of the other categories.<sup>107</sup> This makes intuitive sense in that cargo aircraft tend to fly long missions. Furthermore, there are clear build-ups in the cargo hours per aircraft ratios for Korea, Cold War events, Vietnam, Desert Storm, and post-9-11 operations. At the other extreme, Fighter/Attack hours per aircraft ratios consistently remain much lower than most other aircraft categories. In fact, they do not show any surges after Desert Storm, even though the Air Force's fighter force was heavily involved in the No-Fly Zones over Iraq, combat and policing actions over the Balkans, and of course, Operations Enduring Freedom and Iraqi Freedom. This indicates that either the Air Force has a near-perfect amount of fighter/attack aircraft, or that fighter/attack aircraft are no longer in great demand. Given the general preponderance of fighter aircraft in the total aircraft inventory, the first is the better explanation. In the middle, Trainer hours per aircraft ratios stay consistently above the total average until after Desert Storm, when pilot production decreases. Tankers and bombers stay relatively close in ratios until the 1980s when tanker hours per aircraft visibly drop below the bomber ratio. However, tanker rates climb again in the late 1980s and move above the Air Force average for the duration of the 1990s, surging in the post 9-11 world. The Desert Storm and beyond surge of tanker hours per aircraft ratio is indicative of the importance of air-to-air refueling in the

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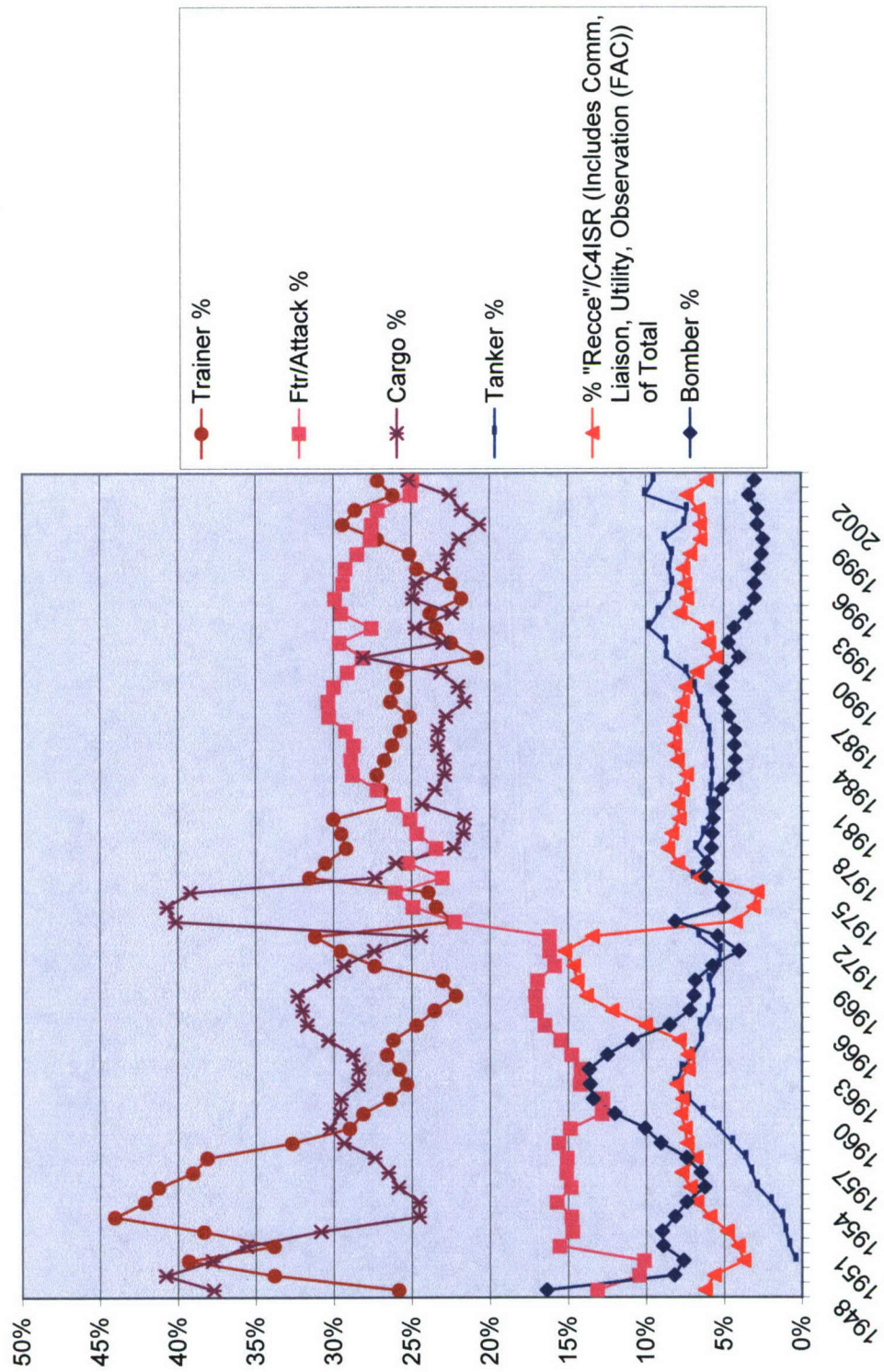
<sup>107</sup> The FY1973-FY1975 aberration occurs because the USAF Statistical Digest amalgamated all cargo-derived aircraft under cargo for those years. For example, the Tanker category disappears because KC-135s were included under Cargo. In addition, other aircraft like the RC-135, EC-135, AC-130 and EC-130 as well as cargo trainers were all lumped under Cargo, resulting in artificially low numbers or no numbers for these categories.



Balkan operations, No-Fly Zones over Iraq and post 9-11 operations. Bombers appear to surge for Desert Storm as well as for post 9-11 combat operations. The “Recce”/C4ISR ratio of hours per aircraft is a difficult amalgamation for flying hours in that it is a mix of fighter-type tactical reconnaissance and electronic warfare aircraft as well as bomber and/or cargo-airframe based strategic reconnaissance and command and control aircraft. Except for the Korean War and early Cold War period, the ratio for this category tends to be close to or exceed the Air Force average. One would expect such aircraft to surge during times of tension or conflict. In addition, C4ISR capabilities that have been transferred to satellites are not captured in these figures.

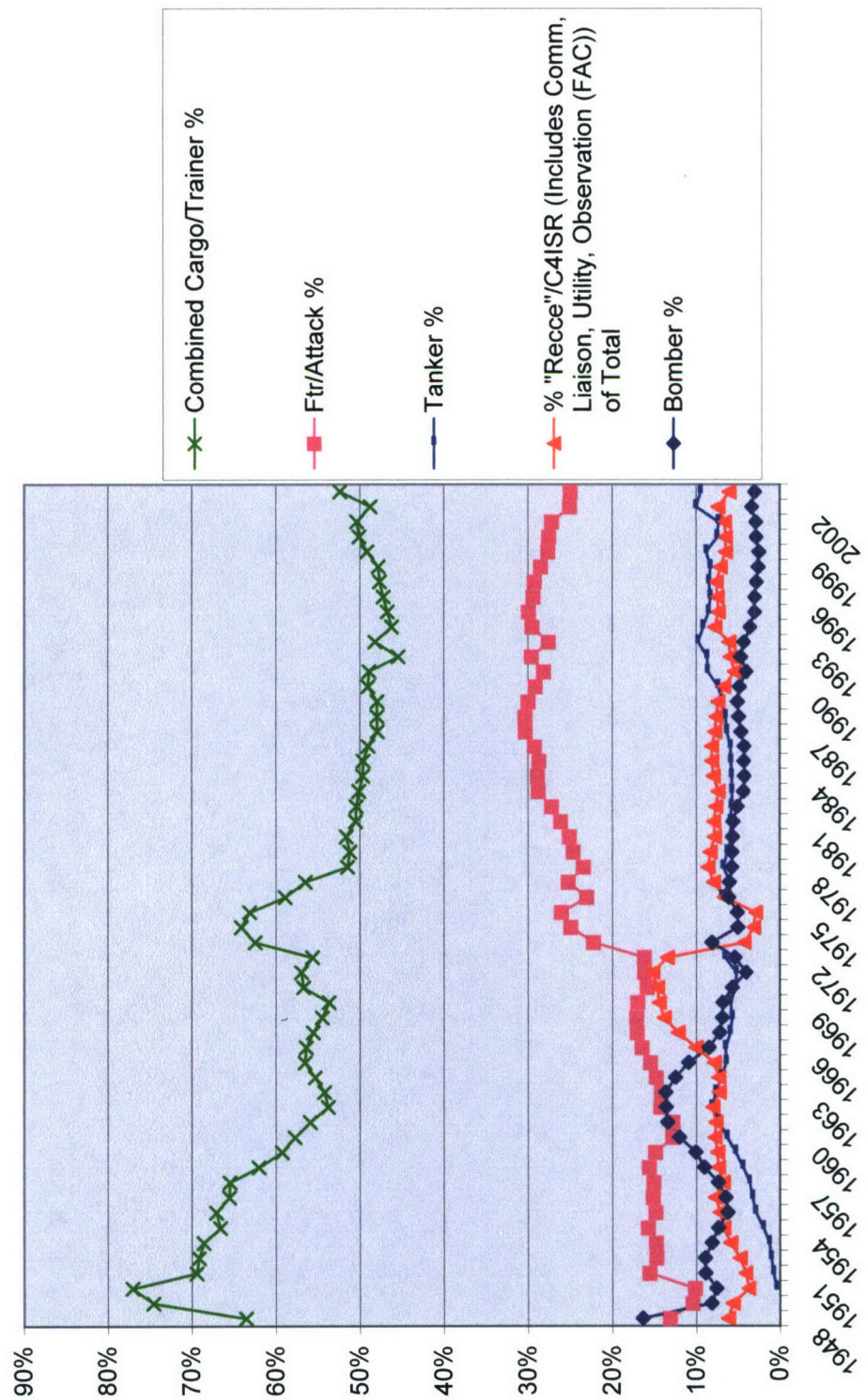
An examination of the Air Force’s allocation of the percentage of flying hours per aircraft type yields Chart 4-19 (Percent of Flying Hours by Aircraft Type). This chart indicates a clear split in the Air Force’s weight of emphasis. There is a sharp difference between Trainer and Cargo aircraft on the one hand, and Bomber, Tanker, and “Recce”/C4ISR aircraft on the other. Trainer and Cargo aircraft each consistently receive 10% or more of the total Air Force flying hours than the aircraft types in the other group. This holds true even during the peak bomber years in the early 1960s. In fact, if the Cargo and Trainer flying allocations are combined, the difference is even more pronounced. See Chart 4-20 (Percent of Flying Hours by Aircraft Type (Cargo and Trainer Combined)). Flying hours allocated to the Cargo/Trainer combined category do not drop below 50% of the total Air Force flying hours until the mid-1980s, and even then, the allocation stays in the high 40s and climbs over 50% again. At the

Chart 4-19: Percent of Flying Hours by Aircraft Type





**Chart 4-20: Percent of Flying Hours by Aircraft Type  
(Cargo and Trainer Combined)**





bottom of the chart, where the combat and combat support aircraft are found, it appears that Fighter/Attack, Bomber, and C4ISR aircraft initially compete for flying hour allocations. The Bomber allocation peaks and matches the fighter allocation in the early 1960s, and the C4ISR (including FACs) aircraft allocation climbs during Vietnam and peaks just below the fighter allocation. However, Fighter/Attack aircraft make a clear jump in the allocation after Vietnam and maintain that position through FY2003. The degree of the separation is clear and quite pronounced in the graph. In addition, the post Cold War ranking of Tanker, then C4ISR, and finally Bomber aircraft flying hour allocation remains consistent.

Consequently, the allocation of flying hours by aircraft type indicates that historically half or more of the Air Force flying hour allocation goes to Trainer and Cargo aircraft. Once again, the Air Force is allocating a large portion of a measurable resource to fields in which it has no monopoly jurisdiction. That is, there is considerable competition from the civilian world and other military services to train pilots and transport people and material with aircraft. The Bomber aircraft flying hour allocation peaked in the early 1960s, and has generally been in decline since then, and in fact receiving less flying hours than Fighter/Attack, C4ISR, or Tanker aircraft since the early 1980s. This indicates a shift and gradual lowering of emphasis on manned bombers—despite the fact that manned bombers provided the Air Force its original monopoly jurisdiction over Strategic Offense. The post Vietnam boost in the flying hour allocation to Fighter/Attack aircraft to the 25%-30% range of the total Air Force

flying hours indicates a clear shift in prioritization favoring the Tactical jurisdiction.<sup>108</sup>

The relative allocation of flying hours to Tanker aircraft has grown over the Air Force's history, indicating the growing importance of Tankers beyond the role of supporting strategic bombers. Finally, C4ISR continues to be a relatively consistent and measurable categorization in the Air Force's flying hour allocation, in spite of the transfer of some C4ISR capabilities to space.

Flying hours can also be broken out by Major Command-type amalgamations instead of by aircraft; however, this provides a distorted picture. After all, Air Training Command is not the only major command flying trainers, the strategic airlift command is not the only one flying cargo aircraft, and the C4ISR command amalgamation of space, communications and intelligence commands is meaningless. The C4ISR flying hours are primarily flown by other commands. For example, the E-3 AWACS belongs to Tactical Air Command and the successor Air Combat Command, and the airborne early warning EC-121 aircraft were part of Air Defense Command. In addition, this would once again ignore C4ISR operations conducted from space or on the ground.

#### High-Level Personnel Weighting as Indicators of Changing Jurisdictional Claims

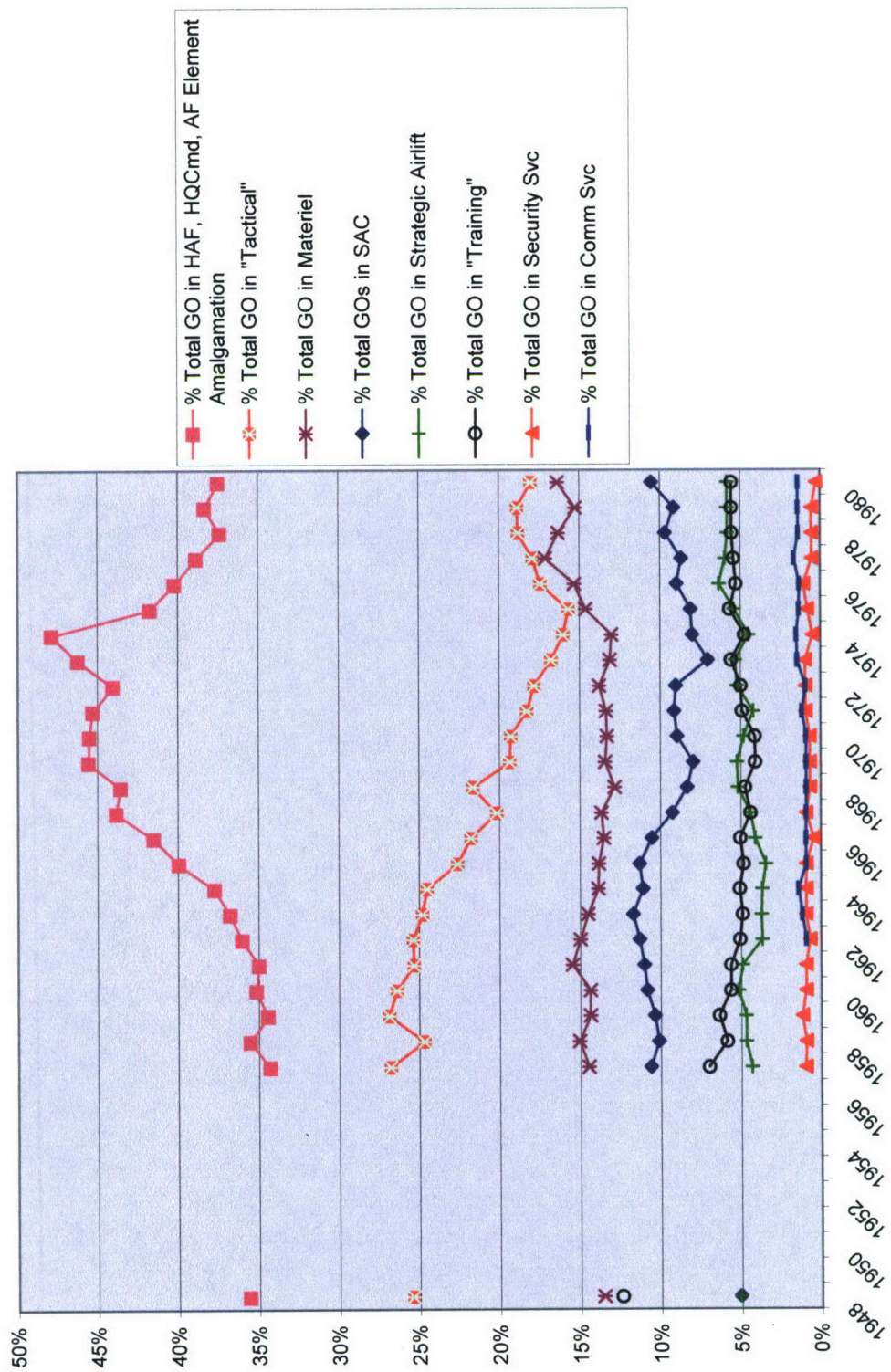
Another way to look at how the Air Force officer corps has changed its sense of mission or jurisdictional priorities is to examine the Air Force allocation of its general officers. Chart 4-21 (Percent of Gen(GOs) by Major-Command-Type Amalgamation)

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<sup>108</sup> Incidentally, this shift, and its perceived or implied permanence, affects all officers serving today since a lieutenant serving in 1972 would hit the 35 years of service retirement mark for a general officer in 2007.



Chart 4-21: Percent of General Officers (GOs) by Major-Command-Type Amalgamation

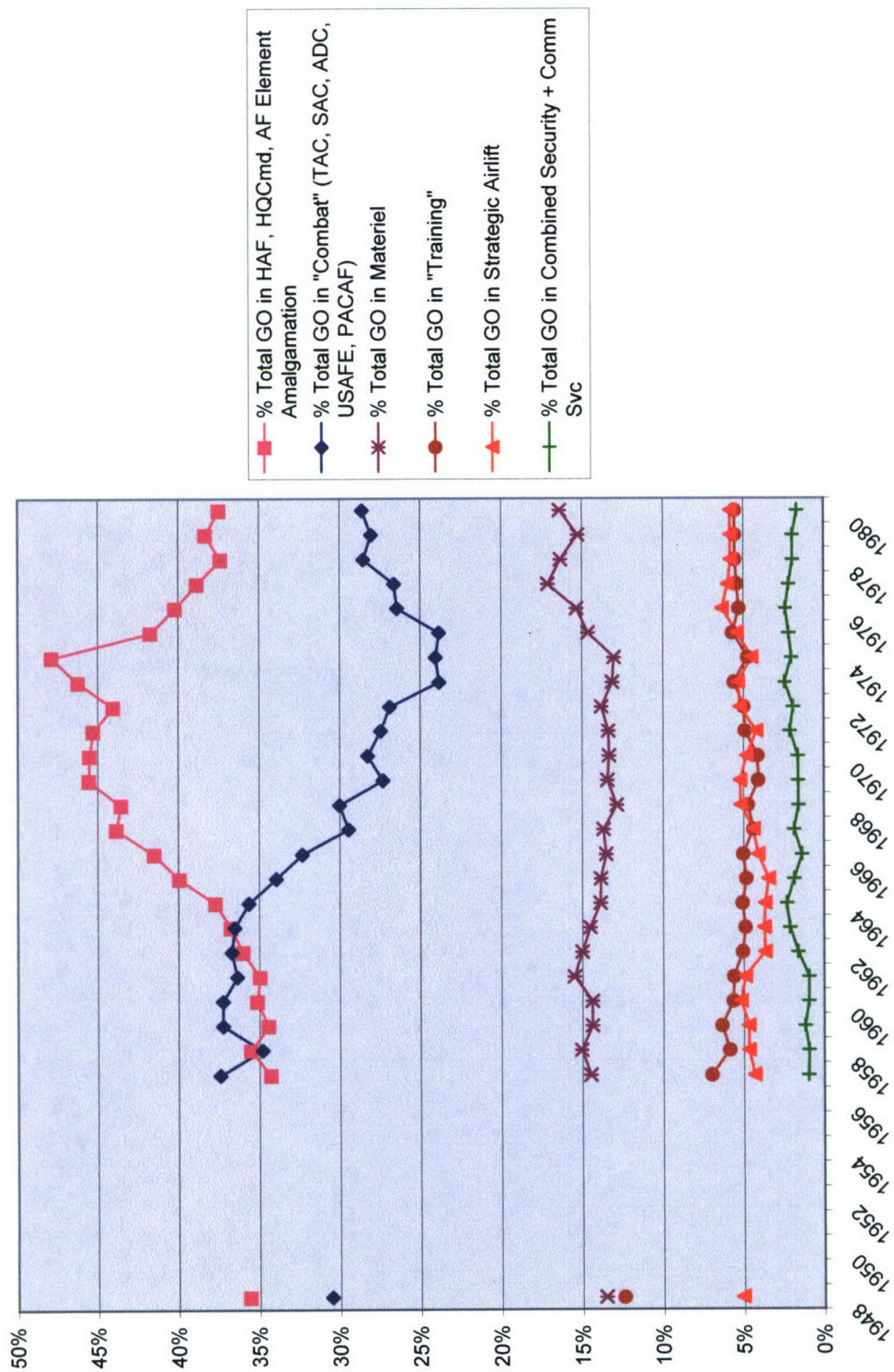




provides a breakdown of general officers along major command amalgamations for the period of FY1957 through FY1980. It appears from the chart that the Air Force's most important mission is running the Air Force and providing Air Force general officer representation in joint multiservice and multinational positions. Typically, over 35% of the Air Force's general officers served in these types of positions. One assumes that this emphasis is the result of requirements to run the Air Force and meet joint and international obligations, and that the primary function of the Air Force officer corps is not simply to perpetuate itself. During this period, the percent of general officers serving in the Tactical major command amalgamation, which includes Strategic Air Defense, dropped from over 25% down to under 20%. However, it still remained the second highest allocation of generals in FY1980. Nevertheless, the percent of general offices in the Materiel command amalgamation approached that of the Tactical command amalgamation by the mid-1970s, indicating a relatively large officer corps emphasis on research and development, purchasing, and maintaining aircraft and other systems. Strategic Air Command general officers come next, lagging by 5% or so since the mid-1970s. The general officer allocations for the Training and the Strategic Airlift (MATS) command amalgamations stay relatively closely entwined for most of the FY1957-FY1980 period. The general officer allocations in the Security Service and in the Communications Service commands remained quite small.

A further amalgamation yields Chart 4-22 (Percent of GOs by Major-Command-Type Amalgamation (Further Amalgamation)). This chart points to the somewhat

Chart 4-22: Percent of GOs by Major-Command-Type Amalgamation (Further Amalgamation)





incongruous conclusion that as the war in Vietnam heated up, the percentage of Air Force generals serving in combat-type commands declined, thereby offsetting a major increase in the percentage of the generals in Air Force Headquarters, Headquarters Command, and joint and allied staff billets.<sup>109</sup> The Materiel command amalgamation general officer allocation remains firmly in third place. Consequently, in terms of general officer allocations during the time period of the graphs, managing the Air Force, i.e., the organizing, training and equipping of air and space forces received the highest priority. Combat forces required far less general officer supervision. Materiel and Training command amalgamations, which would seem to duplicate part of the overall Air Force management responsibilities, accounted for another 20% of the total general officers. Strategic Airlift (MATS) only required about 5% of the general officers, and the C4ISR commands of the Security and Communications Services required even less.

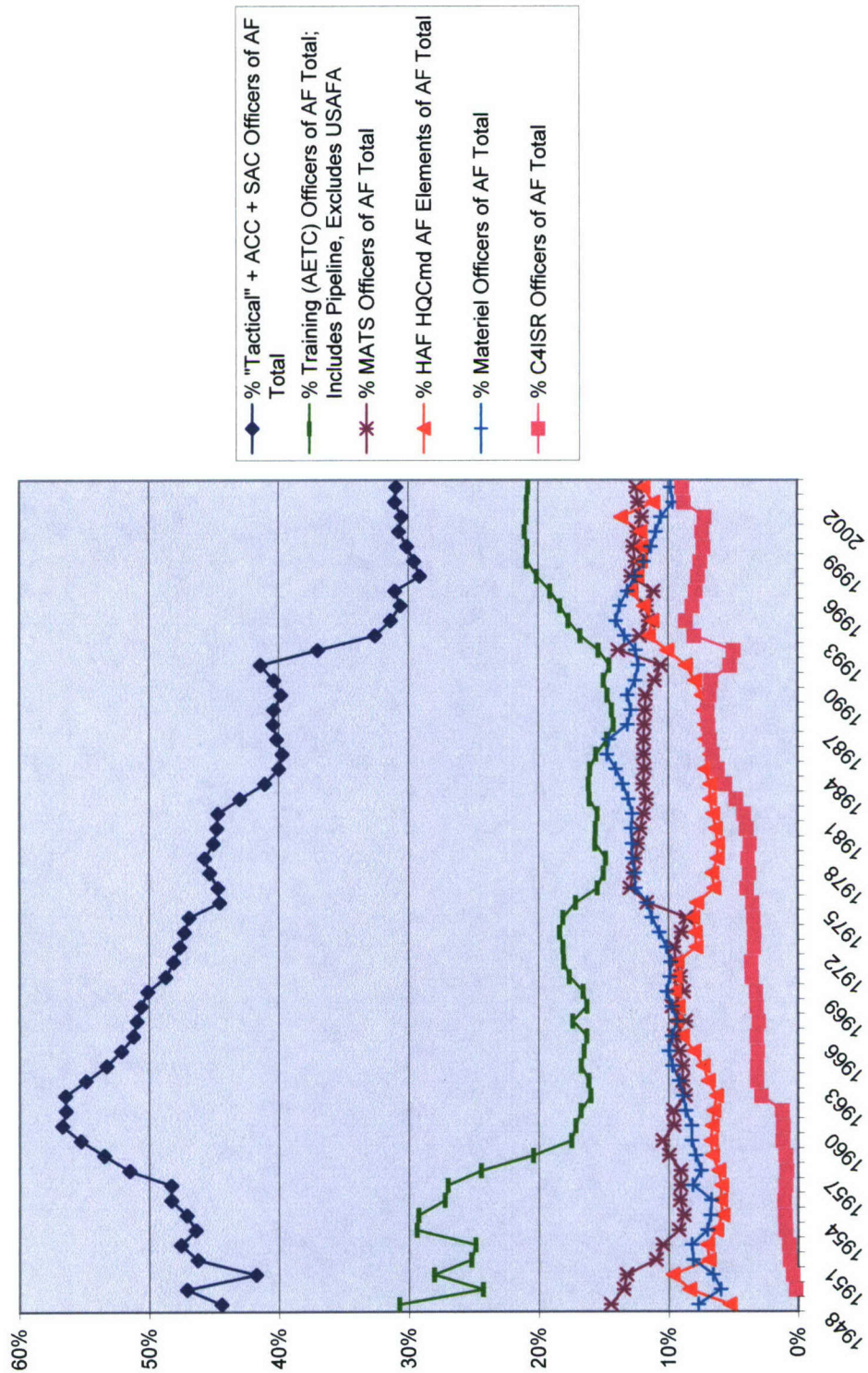
A comparison of the allocation of total Air Force officers between major command types of amalgamated groups is presented in Chart 4-23 (Comparison of Percentage of Officers per Major-Command-Type Amalgamated Groups Flying Combat-Oriented vs All Others (Includes C4ISR Amalgamation)). This chart combines the personnel from all tactical commands as well as from Air Defense Command, Strategic Air Command and Air Combat Command into one group. Although this

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<sup>109</sup> From FY1959-FY1967 the boost is primarily from Headquarters Command, which supported Air Force Headquarters (HAF), but also served as the administrative billets for many officers in joint and allied billets. Headquarters Command climbed from 8% to 21% of the total Air Force general officers. HAF actually decreased by percent of total general officers from FY1960-FY1968 (from 26% to 23%). After FY1968 HAF increased steadily, peaking at 30% of the total general officers in FY74.



**Chart 4-23: Comparison of Percentage of Officers per Major-Command-Type Amalgamated Groups Flying Combat-Oriented vs All Others (Includes C4ISR Amalgamation)**



glosses over the difference between the Strategic Offense, Strategic Defense, and Tactical jurisdictions, it does provide an easy picture of the weighting of Air Force officer personnel in combat commands. Headquarters Air Force, Headquarters Command, and Air Force officers serving in joint and international staff billets are also amalgamated into a single group. The C4ISR amalgamation includes the Air Force Security Service, Communications Service and Space Command.<sup>110</sup> The graph indicates that Air Force officers serving in the flying combat oriented command amalgamation only exceeded 50% of total Air Force officers between FY1957-FY1969, and since that time, the percent of officers in this command amalgamation has been on a relatively steady decline, bottoming out in FY1997 at 29% and then leveling at 31% in FY2003. The percent of officers in the Training command amalgamation remains in second place throughout the Air Force's history, ending at just over 20% in FY2003. The Headquarters command amalgamation, the strategic airlift (MATS) command amalgamation, and the Materiel command amalgamation switch places several times, but all end up in the 10% to 14% range at the end. The C4ISR command amalgamation shows relatively steady growth, starting at zero, but includes 9% of the total Air Force officers in FY2003.

If one looks at officers by the career field specialty in which they are currently assigned, the combination of pilots and navigators, the majority of whom are pilots, has

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<sup>110</sup> Space Command took responsibility for the Air Force ICBM fleet on 1 July 1993.



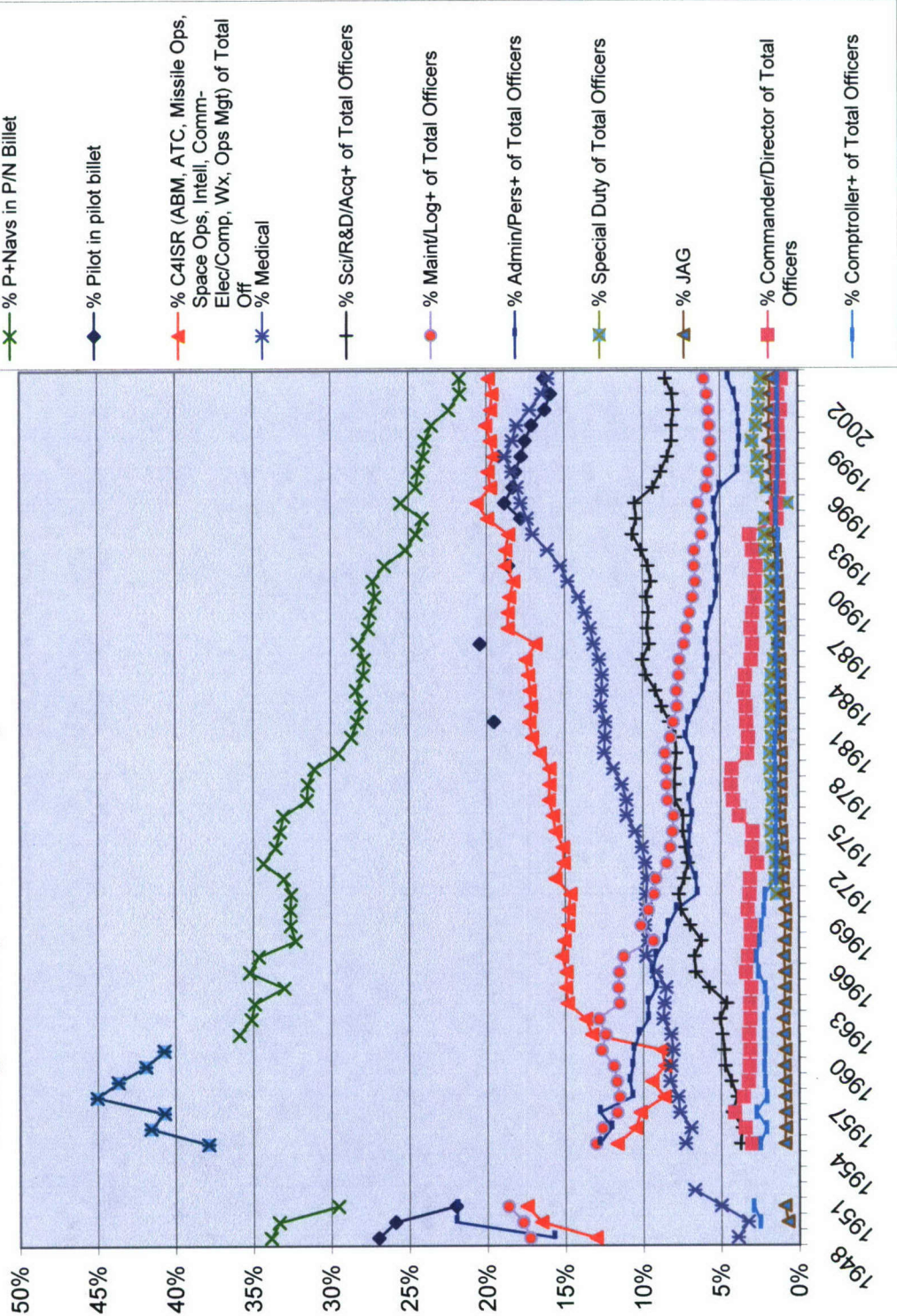
been the historic leader.<sup>111</sup> See Chart 4-24 (Percent of Total AF Officers Serving in Various Amalgamated (Includes C4ISR) Career Field Billets). However, the percentage of pilots and navigator billets was in a relatively steady decline from 36% of the total officers in FY1961 to 22% in FY2003. In fact, from FY1998 through FY2002 officers in the medical amalgamation billets actually formed a higher percentage of the total officer corps than pilots serving in pilot and navigator billets. The C4ISR officer career field billet amalgamation, which includes the Air Battle Manager (ABM); Air Traffic Control (ATC); Missile Operations; Space Operations; Intelligence; Communications, Electronics and Computers; Weather; and Operations Management career field billets, is the second most populated amalgamated career field billet amalgamation for most of the Air Force's history. In fact, the C4ISR career field billet amalgamation matched the number of pilots in pilot billets in FY1991 and clearly exceeded them from the mid-1990s onward. The C4ISR billet amalgamation accounted for 20% of the total Air Force officers in FY2003. The third leading officer career field billet amalgamation was Medical, which includes the Medical Professional (includes physicians and surgeons), Nurse, Medical Services (includes health services administrators), Veterinary, and Biomedical Sciences (includes veterinarians after FY1979, psychologists, and other medical-related fields) career field billets. The Medical billet amalgamation accounted for 16% of the total Air Force officer corps in

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<sup>111</sup> The USAF Statistical Digest series does not break pilot or navigator billets out of the combined category for most of its history.



**Chart 4-24: Percent of Total AF Officers Serving in Various Amalgamated (Includes C4ISR) Career Field Billets**



FY2003. The Scientific, Research and Development, and Acquisition career field billet amalgamation was a distant fourth at 9% of the total Air Force officer corps in FY2003. The Maintenance/Logistics career field billet amalgamation was fifth at 6% of the total Air Force officer corps, and the Administration/Personnel and the other career field billet amalgamations were all under 5% of the total Air Force officer corps.

Consequently, from the perspective of the Air Force's career field billet allocation, the Air Force officer corps prioritized its weight of effort in the following rank order: Manned flying, i.e. pilots and navigators, was first, followed closely by C4ISR (including space and missile operations), and then medical care. From a jurisdictional perspective, manned flight is not a jurisdiction that the Air Force monopolizes, although it does of course have monopolies or near monopolies over certain areas within the jurisdiction such as strategic bombers and air-to-air refueling tankers. The Air Force is dominant in the C4ISR/space/missile operations jurisdiction, at least within the confines of aerospace warfare, but there are competitors for pieces of the total jurisdiction. The Air Force certainly has no monopoly over the medical jurisdiction. At best, flight medicine might offer a niche expertise, but medical practitioners outside the Air Force officer corps also practice aspects of flight medicine. Furthermore, medicine is often taken as one of the original professions, which implies that Air Force doctors, for example, might already have a sense of professional responsibilities that might compete or at least coexist with those of the Air Force officer corps. Finally, with respect to developing, buying and maintaining aircraft and other



equipment, Air Force officers might have experience dealing with specific types of aircraft and equipment, but certainly not for the entire realm of activity in these fields. Furthermore, few in society would ascribe the developing, buying and maintaining of equipment as knowledge meriting the status of a profession.

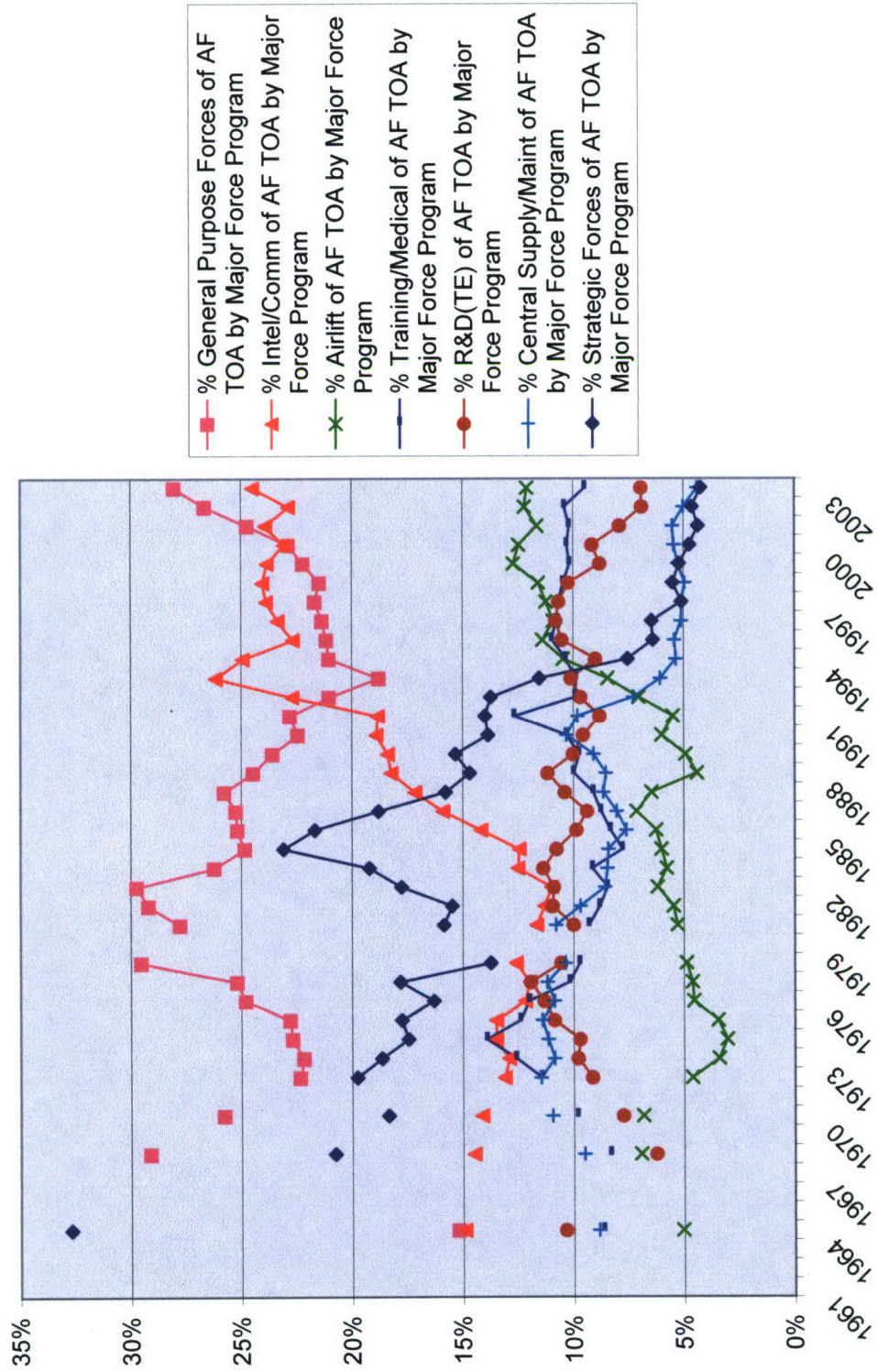
#### Budget Information as Indicators of Changing Jurisdictional Claims

In accordance with the old auditor's adage to "follow the money," Chart 4-25 (Allocation of Air Force Total Obligational Authority (TOA) by Major Force Program (Programs with > 10% of TOA)) shows the allocation of Air Force Total Obligational Authority (TOA) by Major Force Program, with data from FY1964 through FY2003. Once again, the graphs reflect the growth of C4ISR. The chart shows a drop in the percentage allocation to Strategic Forces, from 33% of the total TOA in FY1964 to just 4% of the TOA in FY2003. General Purpose, or tactical, Forces exhibited a more sinusoidal pattern ranging from 15% to 30% of the total TOA.

Intelligence/Communications started out just below General Purpose Forces at roughly 15% of the total TOA in FY1964, but began a climb from the mid-1980s, actually exceeded General Purpose Forces allocations in the early 1990s, and ended in solid second place at 24 % of the total Air Force TOA in FY2003. Airlift also climbed in the standings, starting out at 5% of total Air Force TOA, experienced some ups and downs, then climbed through the 1990s, leveled out in the 2000s, and ended at 12% of total Air Force TOA in FY2003. In FY2003, Airlift was in a distant third place, over 10% behind Intelligence/Communications. From FY1999 through FY2003, fourth, fifth and



**Chart 4-25: Allocation of Air Force Total Obligational Authority (TOA) by Major Force Program (Programs with > 10% of TOA)**



sixth place were held by Training/Medical (9% in FY2003), Research and Development (7% in FY2003), and Central Supply and Maintenance (4% in FY2003).

### Conclusion

The discussion and various graphs presented in this chapter revealed that the Air Force and its officer corps are not static. Instead, their history is marked by change. The weight of effort given to a particular mission varies over time, and new fields develop and are incorporated into the profession. As new types of work were developed and added to the profession, jurisdictions, and the Air Force position within given jurisdictions, changed. Overall, the biggest changes in the types of work performed by the officer corps are symbolized by the jurisdictions of strategic attack and strategic air defense. Strategic attack, or strategic (manned) bombing as it was then called, was a key part of the founding mythos of the independent Air Force. In terms of jurisdictional claims, however, the Air Force officer corps went from a monopoly on strategic attack in 1947 to a shared jurisdiction involving Air Force ICBMs and bombers as well as Navy SLBMs in the 1960s. This jurisdictional distribution still prevails today. Furthermore, within the Air Force, the declining importance of strategic attack relative to other missions, especially the tactical or general purpose forces, was evident in a number of the charts presented in this chapter. Many of the charts also captured what appeared to be the total demise of the strategic air defense jurisdiction as the fighter-interceptor mission passed to the reserve forces. However, this also highlighted that for most of the history of the independent Air Force, the organizational



culture emphasized flying units almost to the exclusion of non-flying, ground-based combat and combat support units. For example, of the two active duty successors of strategic air defense, space was completely ignored in the USAF Statistical Digest series, and C4ISR was only tangentially referenced. In terms of its other two historical combat-type jurisdictions, Air Force tactical forces competed with the other services in the tactical air force jurisdiction for the duration of the study. Air Force air transport provided the bulk of long-range air transport among the services, but has been historically supplemented by contracted civilian air transport. Air Force short-range airlift competed with other services, although the Air Force retains a monopoly over airplanes capable of conducting a large-scale airborne assault.

Although Air Force reporting on its functional missions was skewed, shifting the metric to an examination of the number of squadrons assigned to a particular work still showed the growth in importance of C4ISR. In fact, in spite of the bias against non-flying squadrons, the number of C4ISR squadrons historically rivaled the number of Strategic Airlift squadrons using USAF Statistical Digest data. Switching to Air Force Magazine data to include space and C4ISR squadrons yielded two further conclusions. First, the number of C4ISR squadrons exceeded the number of Strategic Airlift squadrons for the duration of the reporting. Second, the increasing number of squadrons in the Space “Operations” amalgamation was approaching the number of squadrons in the Strategic Airlift amalgamation. Consequently, the data supports the argument that C4ISR is indeed a potential jurisdiction and that the Air Force office



corps is moving to fill it as well as a potential jurisdiction for visionary types of warfare.

The chapter presented a variety of other statistical data further supporting these claims. For example, a graph of the history of the ratio of officers per aircraft indicated a constant shift in the officer corps away from flying duties. Another graph demonstrated that in the post Cold War world, C4ISR aircraft received a bigger allocation of flying hours than bombers. A look at overall officer manning revealed the somewhat surprising fact that the majority of total Air Force officers have historically not served in combat oriented major commands. In fact, the percent of officers serving in flying combat oriented major commands only exceeded 50% of the total Air Force officers between FY1957-FY1969. After that period, this percentage dropped rather steadily to about 30% in FY2003. Meanwhile, over the Air Force's history, the percentage of total offices serving in C4ISR major commands climbed from zero initially to 9% in FY2003. A brief examination of total officer manning by career field billets revealed an Air Force officer corps weighting that placed the amalgamation of pilots and navigators first, C4ISR second, and the combined medical fields third. Finally, charting Air Force budget Total Obligational Authority (TOA) by Major Force Program revealed a similar pattern of the decline of the Strategic Forces, the rise of General Purpose Forces, and the rise in Intelligence/Communications to the second highest TOA category behind General Purpose Forces.

Chapters 5 and 6 continue the discussion of the Air Force officer corps' expertise and jurisdictions by exploring the interaction of technology, weapons, and the command and control system as well as the evolution of C4ISR and where it is today. That will conclude the part of the manuscript dealing with expertise and jurisdiction. The corporateness part then follows, based on the premises developed in the first parts of the manuscript.

## Chapter 5: Aircraft/Weapons Technology is Shifting the Locus of Decision-Making to the Command & Control System

### Introduction

The issue separating the heroic from the visionary warrior is not one of technology *per se*. Heroic warriors are not anti-technology. The airplane, after all, was the symbolic culmination of man's technological progress for most of the 20<sup>th</sup> century. The Air Force heroic warrior does not advocate a return to warfare with spears, nor even to the wind-in-the-wire biplane era. The heroic warrior archetype likes modern aircraft and is enthralled with the idea that succeeding generations have evermore capabilities.<sup>112</sup> However, the heroic warrior sees the pilot, with his airplane strapped on, as the centerpiece of modern battle. The visionary warrior, on the other hand, has adapted the rapture of constantly evolving technology for aircraft into a general embrace of continuous technical revolution—that need not center around an onboard pilot. The visionary warrior has an open horizon before him, but the heroic warrior

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<sup>112</sup> Carl Builder touched on this phenomenon in his two books on military and Air Force organizational culture, The Masks of War (1989) and The Icarus Syndrome (1994). Builder described an obsession with technology inextricably tied to manned flight, i.e., piloting. In fact, Builder questioned whether Air Force pilots are really tied to the institution of the USAF and its claim to be a decisive instrument in warfare, or just to flying: "One could speculate that, if the machines were, somehow, moved en masse to another institution, the loyalty would be to the airplanes (or missiles). ... The prospect of combat is not the essential draw; it is simply the justification for having and flying these splendid machines." See Carl H. Builder, The Masks of War: American Military Styles in Strategy and Analysis (Baltimore: Johns Hopkins UP, 1989) 23. However, Builder did not have it quite right. Builder's emphasis on organizational culture overlooked the key role that the sense of professional responsibility plays within the officer corps. "The prospect of combat" has skyrocketed since 1991 with Desert Storm and the ensuing no-fly zone patrols, which did not end until Operation Iraqi Freedom, no-fly zone enforcement in the Balkans, the air campaign against Serbia, and the ongoing operations in Afghanistan and Iraq. Heroic and visionary Air Force officers remain firmly committed to their "splendid machines," but there is no doubt in any officer's mind that the profession is about war.



faces a dilemma. The heroic warrior and the profession *in toto* must embrace new technologies. Maintaining the edge against both potential enemies and jurisdictional competitors requires that neither be allowed to gain technical advantage over the Air Force officer corps. The public and government could potentially take away the Air Force officer corps' jurisdiction, or at least intervene in the profession and force changes, if the public perception became one that the Air Force could not fulfill its missions, or that the Navy, for example, could do it better. However, it is difficult to embrace only technologies that specifically support human pilots in the cockpits of combat aircraft. It is not a matter of accepting some technological improvements, like air-to-air missiles for example, but not others like an integrated command and control system. Each improvement to make the combat aircraft more effective and more efficient is potentially another step towards the end of manned combat aircraft.

The heroic and the visionary warrior are both caught up in the technological landslide. The same basic concepts and technologies that guide an air-to-air missile from a fighter aircraft can be used on a surface-to-air missile, and the same GPS-type navigational improvements added to a long-range bomber could be used on a long-range cruise missile or surface-to-surface missile. Continuous technical developments will eventually, if they have not already, make the expertise of human pilots flying in aircraft cockpits on reconnaissance or combat missions redundant. Keeping the onboard pilot the centerpiece constrains technological development to the abilities of the weakest link—the man in the cockpit. Consequently, the heroic warrior must find

new justifications, new jurisdictions for human pilots, while visionary warriors simply search for new ways to synergistically harness and command the emerging technologies.

This chapter is the first of two that examines the interplay between technology, expertise, jurisdiction and the migration of combat decision-making out of the cockpit into the command and control, or C4ISR, system. Chapter 6 will look specifically at the evolution of the C4ISR system. This chapter will focus on how technological improvements to aircraft and weapons indirectly lead to the shift in decision-making. The first area to be examined is the increased safety and survivability of aircraft. As fewer aircraft are lost in accidents and during peacetime, the Air Force requires fewer aircraft. However, as the numbers of aircraft decrease, the importance of controlling them increases since the margin for error decreases. The second area is the differing rates of change per aircraft types. Officers who fly in types of aircraft that experience greater technological change are more accustomed to both changing technology and modern technology, which potentially makes them more visionary in outlook. The third area is Air Force weapons. As weapons become more capable, there is a greater reliance on accurate and up-to-date intelligence and less dependence on pilot flying skills to employ them. The net result is that the locus of combat decision-making is

migrating away from the cockpit and up into the command and control system, whether to the air battle managers or to the Forward Air Controller (FAC).<sup>113</sup>

### Safety and Survivability

Although it is quite clear that technology has been the major driving factor in increasing the range, speed, payloads and altitudes of aircraft, technology has also been a key factor in increasing the safety and survivability of aircraft. *Safety* is measured in things like major accidents, lost lives and lost aircraft, primarily in non-combat operations. An aircraft's *safety* is affected by internal factors such as its design, maintenance, and operating characteristics, by pilot and/or crew training and procedures, and by external factors such as weather, air traffic control and landing systems. There is obviously interplay among the factors, but the point here is simply that technology has played a significant role in improving aircraft safety. Moreover, aircraft safety also falls into the bailiwicks of jurisdiction and responsibility. The public expects an efficient and effective defense, and high aircraft accident rates do not support

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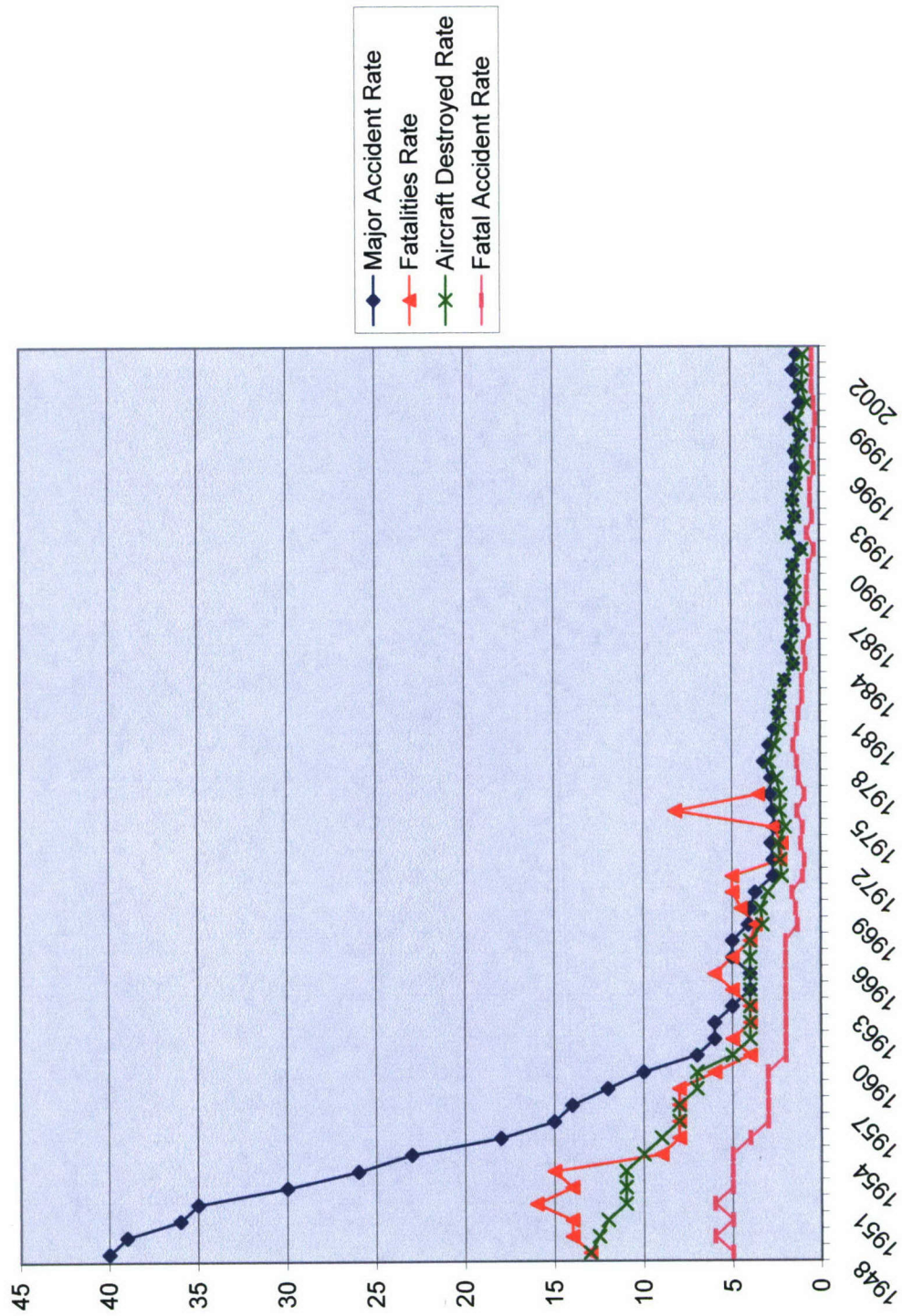
<sup>113</sup> In this manuscript, I do not restrict the term *Forward Aircraft Controller* or *FAC* to its typical connotation. In the Air Force, it typically refers to an officer, usually a pilot, who acts as a man on the scene coordinator between Army or Marine units on the ground and aircraft providing close air support for the ground troops. The FAC may be on the ground or airborne, and he specifically directs the supporting aircraft as they attack the targets he assigns them. However, there are also enlisted positions that perform the same work or do some of the work under a ground controller's supervision. For example, in the Air Force there are enlisted terminal attack controllers, enlisted special operations combat controllers, enlisted radio operator maintainer and driver (ROMAD), air liaison officers, officer forward aircraft controllers (airborne), officer forward aircraft controllers (ground), tactical air control party members, and air support operations squadrons. In addition to the Air Force mix, the other military services have a similar mix of enlisted and officer positions, which frequently also include the mission of requesting and controlling artillery support. Consequently, I frequently use the term *FAC* in the broader sense of all these positions that directly assign targets, mark targets with lasers, and control aircraft performing close air support



either. The public does not want to spend excessive sums of money on bad aircraft. Finally, the public does not want to send its children into a profession with an inordinate death rate—before combat is even considered.

The Air Force prefers to use rates per 100,000 flying hours for its safety statistics. It makes it easier to compare across years as flying hours fluctuate and it removes the actual numbers of lives lost and of aircraft lost from purview, substituting instead very small rates. The Air Force's major accident rate dropped from approximately 40 per 100,000 flying hours in 1948 to 5 in the early 1960s and then eventually leveled out around 1.5 in the mid-1980s. See Chart 5-1 (Air Force Flying Safety Rates). Although the exact definition of a major accident has varied over time because of a connection to dollar figures, an accident that resulted in a fatality or the destruction of an aircraft is the general definition of a major accident. To put further put this in perspective, if a pilot flew 3,000 flying hours over his Air Force career, which is not an unreasonable number, he should have statistically had one major accident at the 1948 rate. At the early 1960s rate, his odds of having a major accident

Chart 5-1: Air Force Flying Safety Rates (Rate per 100,000 Flying Hours)





during his career dropped to 15%, and at the 1980s rate the odds dropped to 5%.<sup>114</sup>

The rates for fatal accidents and aircraft destroyed followed similar patterns, with dramatic decreases from 1948 to 1960, followed by a leveling out, then a further decrease with a new lower level by the 1980s. Actual fatalities peaked in 1953 with 1274 fatalities from aircraft accidents, and was typically well below 50 per year in the 1990s. See Chart 5-2 (Flying Safety Actual Numbers of Events). These shifts occurred despite the major changeover to a predominantly jet air force.<sup>115</sup> As technology and training improved, the accident rates fell, and succeeding generations of aircraft became safer.<sup>116</sup>

*Survivability* refers to the aircraft and crews ability to perform their mission and return home. It is not the basic flying and accidents covered by safety, but the ability to survive in combat situations. Once again, there is interplay between the aircraft, the pilot and/or crew, and external systems and events. An aircraft may be more survivable

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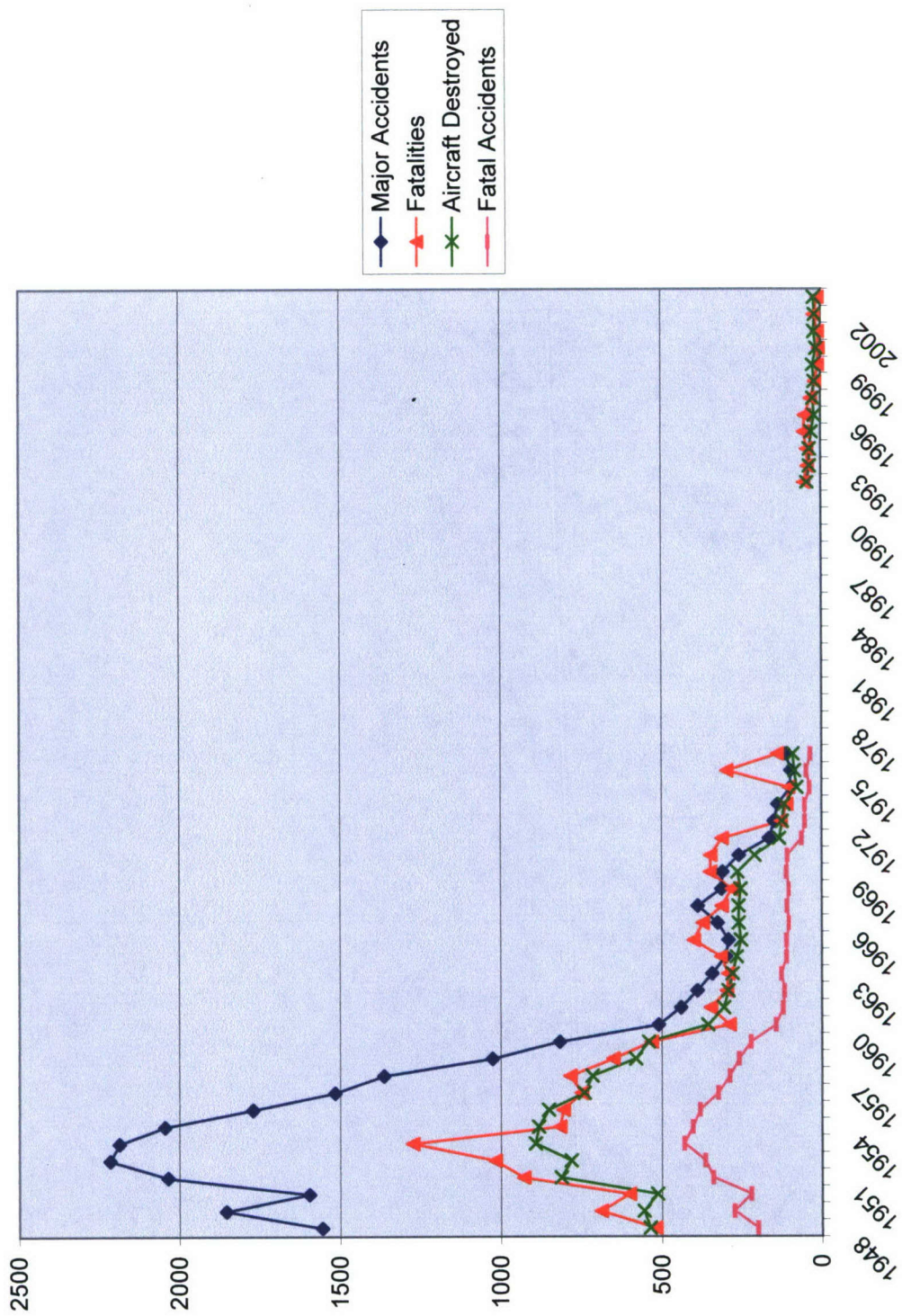
<sup>114</sup> There also is a differentiation with respect to safety between different types of aircraft. For example, as overall accident rates sank, fighters went from a low in 1949 of making 32% of the total major accidents, peaked at 66% of total USAF major accidents in 1954, and then generally stayed between 50% and 60% of the total USAF major accidents through 1976. Bombers, however, hit a high of 16% of the total USAF major accidents in 1950, then gradually declined to around 5% by 1976. Trainers spiked to 33% in 1955 with the introduction of the first jet, the T-33, into basic pilot training, but then went on a fairly steady decline to 9% of the USAF total major accidents in 1967, then bounced around 10% through 1976. There were of course, cultural ramifications from these statistics. As the Air Force officer corps shifted its combat emphasis from bombers to fighters, more officers flew fighters. Fighters, however, were not just sleek, fast and fun, they were also more dangerous simply to fly, even in peacetime. However, this was a positive thing culturally, because it added to the mystique of being a brave, fighter pilot.

<sup>115</sup> For example, as the accident rates went down, from the mid-1950s to 1963, the Air Force experienced a dramatic increase in the percentages of fires after accidents, a slight increase in the number of fires prior to accidents, and a moderate increase in the number of accidents affected by engine stoppages.

<sup>116</sup> In addition, the incidents of pilot error being the primary cause of major accidents or a contributing factor dramatically dropped, intersecting the general levels of material failure as a primary or contributing cause. Once pilot error drops to a certain level, material problems are more evident.



Chart 5-2: Flying Safety Actual Number of Events



against surface-to-air missile (SAM) systems by flying at high speed and low enough to avoid or skirt the SAM's radar coverage. Flying lower, however, exposes the aircraft to more antiaircraft artillery, decreases its range, and increases its risk of an accident. In addition, an aircraft might have automatic flare dispensers to confuse enemy heat-seeking missiles, an electronic warfare capability to drop chaff or jam enemy radar signals, or it might make use of stealth technology to evade enemy radar or infrared-based defenses and fly at higher altitudes. Finally, the weapons an aircraft carries determine how far away from threats the aircraft can be, i.e., its "standoff range," when it shoots. External systems could range from tanker aircraft to extend the combat aircraft's range so that it can fly around some threats, an extensive reconnaissance system with information on where enemy threats are, supporting aircraft conducting electronic or weapons strikes against enemy threats, and a command and control system to warn combat aircraft of threats or direct them in destroying threats. The pilot's and/or crew's training, knowledge, experience and procedures play important roles in how the crew uses the aircraft's capabilities and external information to maximize its survivability while still achieving its mission objectives.

A comparison between Air Force battle deaths and deaths resulting from aircraft accidents in-theater in the Korean and Vietnam Wars shows that in both cases, deaths from aircraft accidents make up 45% of the total Air Force fatalities. Flying is a dangerous business, with almost as many deaths in theater caused by accidents as by the enemy. In both wars, pilots make up the majority of battle deaths, 59% in Korea and

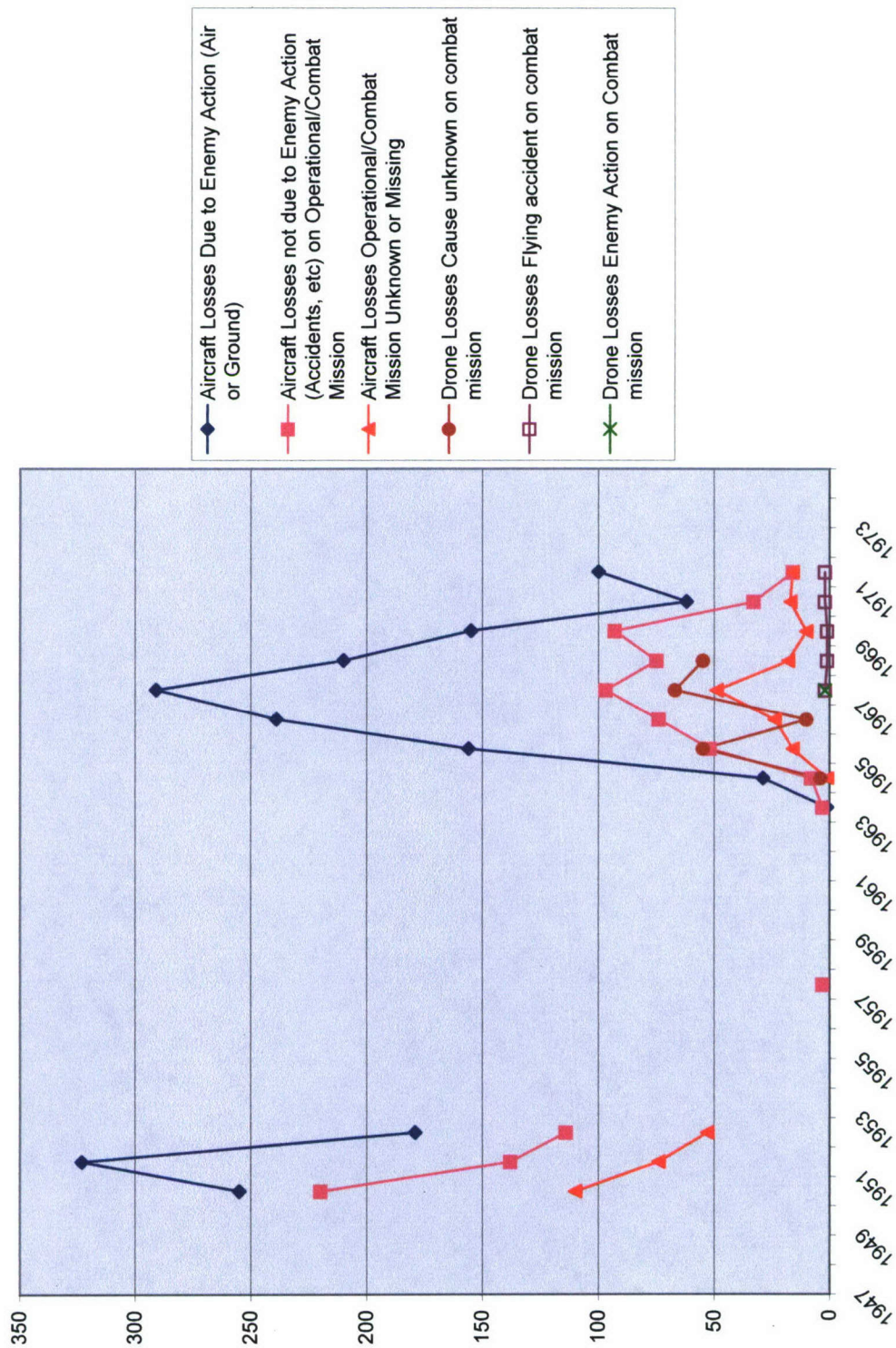


58% in Southeast Asia. If one switches the perspective from fatalities to aircraft losses, then the general trend in both wars is for the majority of aircraft to be lost to enemy action, either in the air or on the ground. See Chart 5-3 (Aircraft Losses Combat Theater). However, data on aircraft losses includes more categories than the fatality data. Aircraft losses not due to enemy action, but presumably accidents, is the second leading category, with aircraft listed as missing or lost for unknown reasons making up the third. This third category is interesting because the more pervasive the C4ISR system is, the fewer lost aircraft fall into this category. The number of aircraft listed as missing or lost for unknown reasons annually in Vietnam was always lower than the lowest Korean annual number for this reason. Conversely, the drones had high numbers for this category because they had no way to inform the C4ISR system whether they had been hit by AAA or were experiencing an electrical or mechanical failure prior to disappearing.

The data for Desert Shield and Desert Storm is somewhat different with respect to aircraft losses. First of all, the operation was very short. The wars in Korea and Vietnam both lasted years. However, Desert Shield, i.e., the defense of Saudi Arabia and the buildup to liberate Kuwait, lasted approximately five months. Desert Storm, the war itself, only lasted approximately six weeks. Consequently, overall losses are much lower. For example, from August 1990 through mid-January 1991, the Air Force lost six aircraft to accidents while supporting Desert Shield. During the roughly six-weeks of combat operations in Desert Storm, the Air Force lost 14 aircraft due to enemy



Chart 5-3: Comparison of Annual Aircraft Losses (Combat and Other) in Theater for Korea and Vietnam



action, but another six in non-combat related accidents. Consequently, if Desert Shield and Desert Storm totals are combined, which is not unreasonable given the war-like atmosphere that surrounded Desert Shield, 14 aircraft were lost in combat and 12 were lost in accidents. This brings the percentage of aircraft losses due to accidents in Desert Shield/Storm (46%) quite close to the percentage of fatalities caused by aircraft accidents in Korea and in Vietnam (45%).

Although it is easy to see that as airplanes evolved from the dope-covered canvas and wood biplanes to all-metal construction, and propellers to jets, that planes have become more capable. They fly faster, higher, further, and carry more ordnance. What is less apparent looking back is how dangerous flying once was. From the perspective of today's accident and fatality rates, it is hard to imagine the Air Force losing over 1200 people in aircraft accidents in one year. Aircraft safety has increased dramatically over the life of the Air Force. So has survivability in combat. In fact, it appears to be a peculiarity of Air Force operations that the difference between combat and aircraft accident fatalities in Korea and Vietnam, and the difference between aircraft lost in combat and to accidents in Desert Shield/Storm are so low. One might have expected big differences between losses due to combat and to aircraft accidents. Since this is not the case, there is no compelling for the Air Force officer corps to invest in large numbers of unnecessary aircraft to maintain as combat reserves. The officer corps can meet its needs with fewer aircraft not just because they are more capable, but also because fewer are lost in accidents or in combat. One reason that they are more



survivable in combat is that the C4ISR system has improved. This leads to better intelligence on enemy threats, better situational awareness, and better integration of electronic warfare and anti-command and control warfare. On the other hand, since there are fewer, but more capable aircraft, they are harder to replace and consequently more valuable. Consequently, it becomes more important to the air component commander to have control over each aircraft.

#### Different Rates of Change in Aircraft Technology

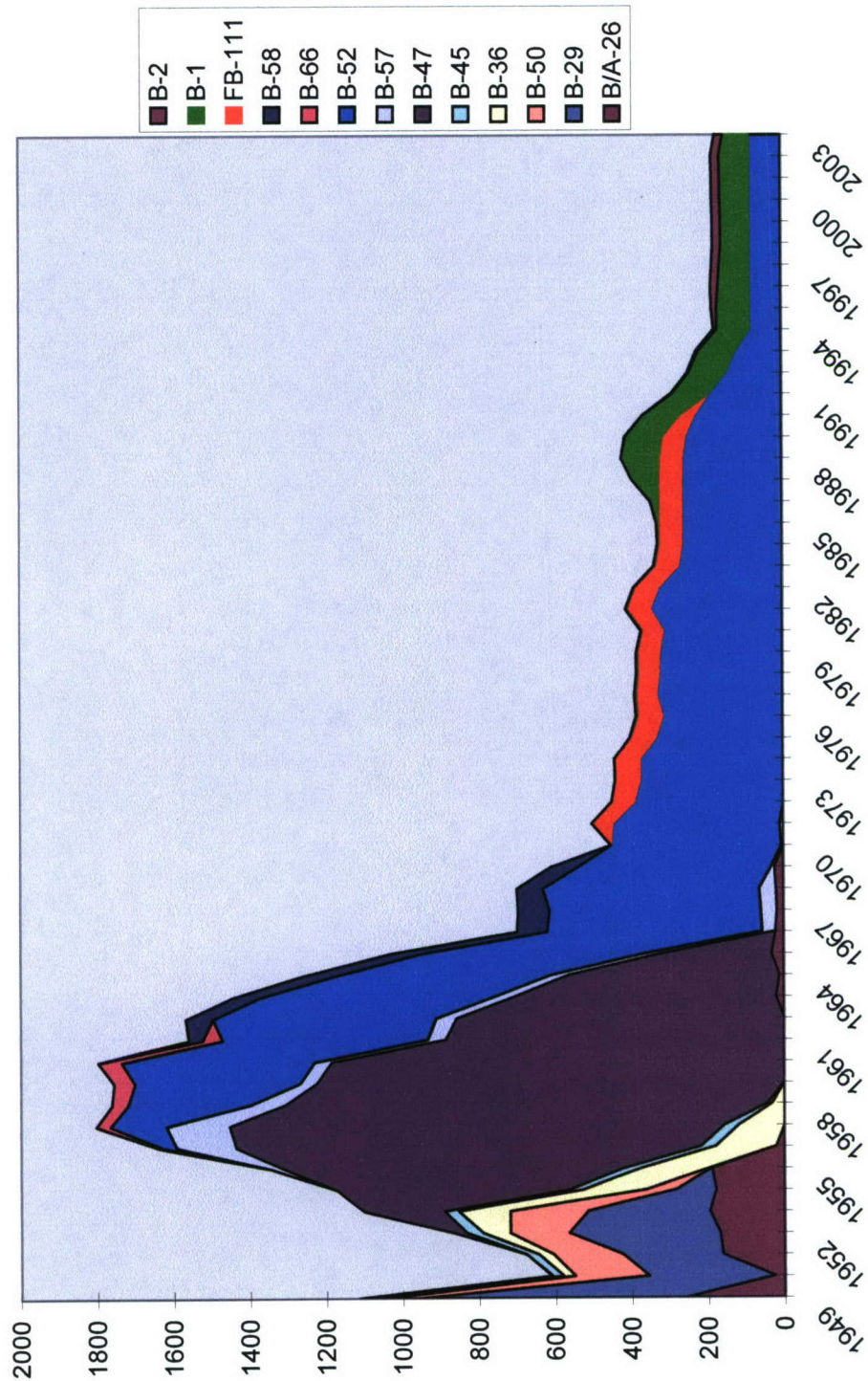
Technology has produced aircraft that can fly higher, faster, and farther, carry more ordnance, and that are safer and more survivable. However, the Air Force officer corps has implemented new technologies at different rates in different types of aircraft. The Air Force does not buy new bombers, fighters, tankers, cargo, trainer and C4ISR aircraft or missiles in equal amounts each year. The Air Force does not have an unlimited supply of money, so the officer corps must make trade-offs in deciding how to spend the money it is allocated. Although the officer corps faces the traditional trade-offs such as between investing for tomorrow or buying for today, it must remain conscious of its social responsibility to defend the nation as well as jurisdictional competitions. The officer corps' general declining weight of effort applied to the Strategic Attack jurisdiction shown in Chapter 4 along with the increasing weight of effort applied to the Tactical jurisdiction is reflected in the different rates of change in the application of new aircraft technology. This is important because officers who fly in types of aircraft that experience greater and more frequent technological change are



more accustomed to both changing technology and modern technology. This also means that they have potentially had more experience with the increasing impact of C4ISR on Air Force operations.

The difference in the historical technological development between Air Force bomber and fighter aircraft is dramatic. In the case of bombers, the B-52 stands out. See Chart 5-4 (Number of Bombers Possessed by Year and Type). The B-52 flew and stood nuclear alert during the Cold War, and bombed conventionally in Vietnam, Desert Storm, NATO operations in the Balkans, and in the on-going operations in Afghanistan and Iraq. By June 1956, for example, the Air Force had 63 B-52 crews and 35 B-52 aircraft on hand. On hand crews peaked with 1065 in 1964, and on hand aircraft peaked a year earlier with 613. Although it did not overtake the B-47 in terms of quantity until 1964, the B-52 has remained the backbone of the Air Force bomber fleet through 2003 and beyond. Furthermore, deliveries were completed in 1963, with most modifications since that time primarily designed to accommodate new weapons, navigational systems and electronic warfare systems. The B-52's mission and weapons profiles have changed, the tail-gunner was moved up to the cockpit and given remote controls, and the importance of the electronic warfare officer for survivability has skyrocketed. However, for the pilot, flying, i.e., manipulating the yoke, rudder pedals and throttles, has changed very little. The story is quite similar with tankers, whose primary mission has always been to stretch the range of the strategic bombers. The KC-135 became operational in 1958, eclipsed the KC-97 in terms of quantity by 1963, and has remained

Chart 5-4: Number of Air Force Bombers by Type and Year



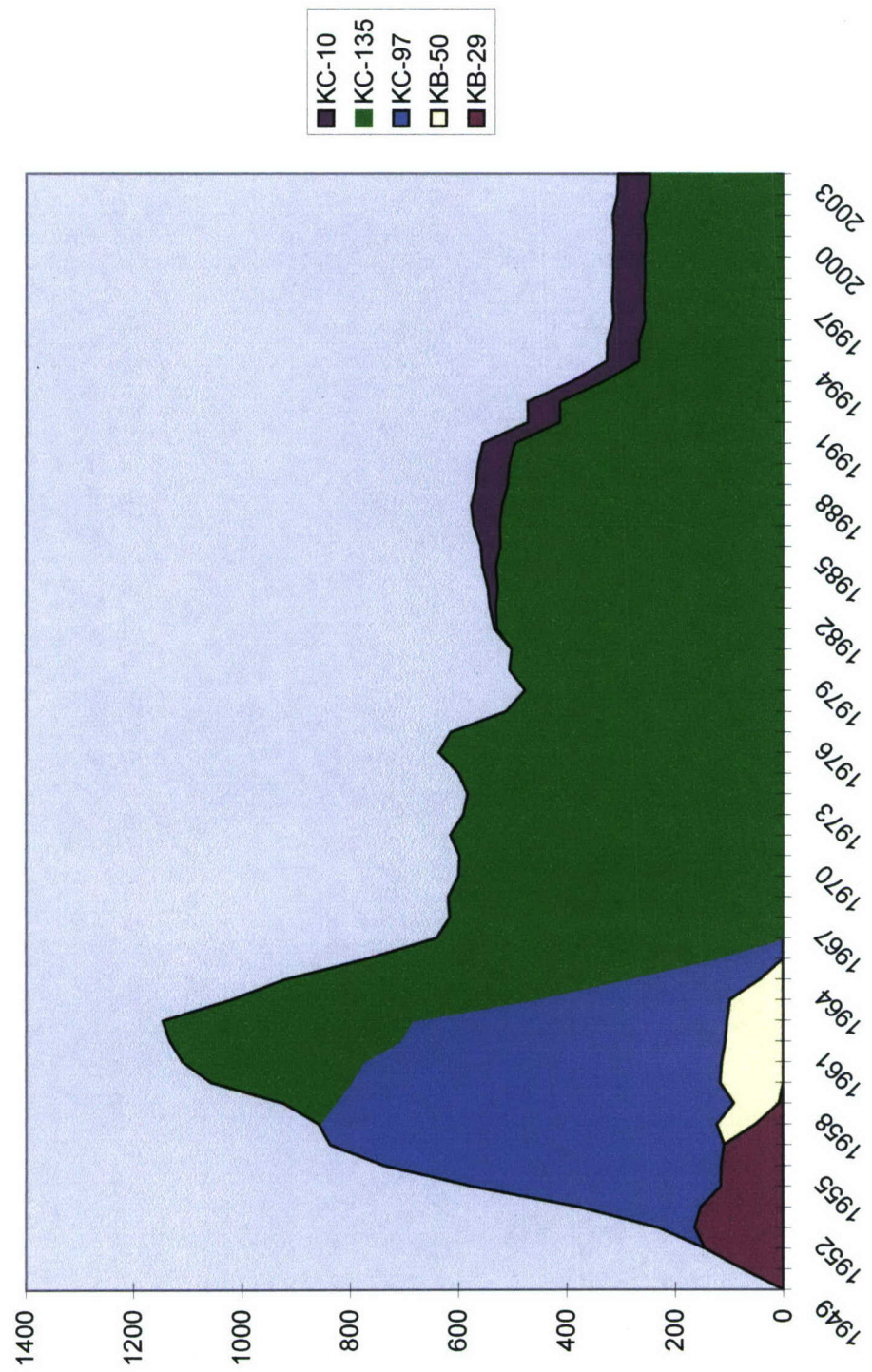


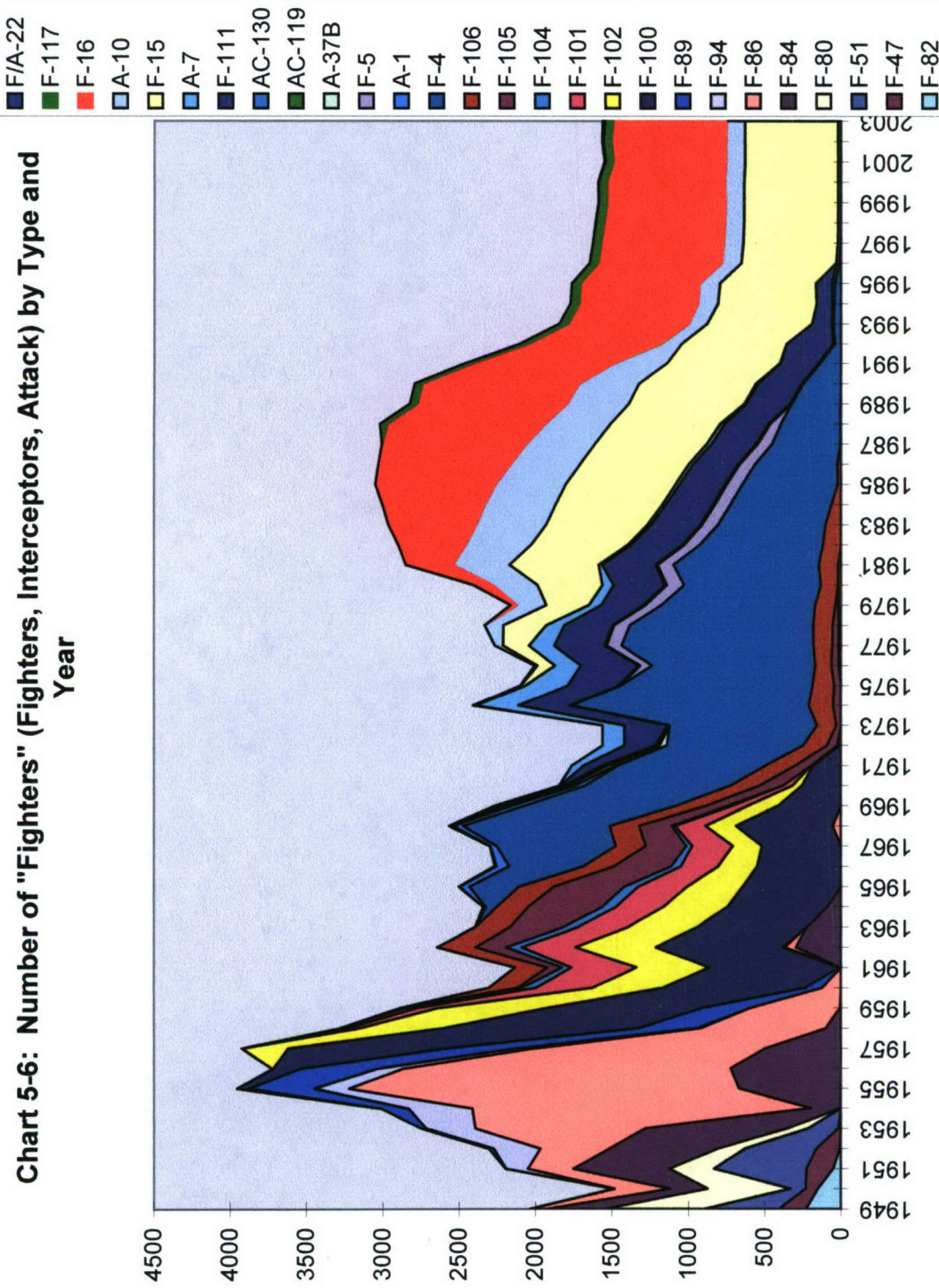
the Air Force's primary tanker through today. See Chart 5-5 (Number of Tankers Possessed by Year and Type). Although there have been modifications, including re-engining, the aircraft's structure and controls remain essentially unchanged. In the case of the B-52 and KC-135, a colonel or general can fly the same plane they flew as lieutenants, and possibly the same plane their fathers flew, with no major changes to the flying controls and handling characteristics of the aircraft. To a pilot, the work and the tools remain essentially unchanged.

By comparison, fighters have undergone dramatic changes over the same time periods. See Chart 5-6 (Number of Fighters Possessed by Type and Year). First of all, the tactical air force has cycled through airframes at a much faster rate. In 1957, for example, the Air Force had over 1500 F-86s on hand, but also over 1000 F-100s, 495 F-84s, and 470 F-89s. In 1969, the Air Force had almost 1000 F-4s on hand, still over 400 F-100s, roughly 200 F-102s, 200 F-106s, 140 F-105s, and 100 F-101s. By 1978 the Air Force had on hand 1200 F-4s, approximately 130 F-106s, 300 F-111s, 120 A-7s, 280 F-15s, and 120 A-10s. By 1997 the Air Force steadied out with over 600 F-15s, 130 A-10s, 800 F-16s, and 50 F-117s. In addition to the obvious changes in aircraft types, except in the case of the 2-seaters like the F-89, F-94 and F-4, every modification for weapons and new technologies has affected the pilot as well. There is no bombardier or electronic warfare officer to handle the modifications—the pilot does it all. This leads to a certain level of technological complexity, which is quite evident in software changes. For example, modern fighters are designed to minimize the time a pilot is



Chart 5-5: Number of Tankers by Type and Year







required to take his hands off the controls. The throttles and stick are full of toggles and switches, and major software upgrades may change the purposes of various switches or switch sequences. Squeezing the trigger does different things in different modes as well as in different software packages.<sup>117</sup> Flying the F-16 is not the same in 2003 as it was in 1983, and it is generations ahead of the F-86s of 1957. The work may be very similar, but the tools have changed dramatically.

Consequently, there is a difference between pilots of bombers, tankers and fighters within the officer corps in terms of exposure to technology as a tool to accomplish one's work. This different rate of technological innovation between aircraft types is amplified by exposure to the C4ISR system. Fighters have traditionally had more interface with air battle managers and the command and control system in flight while on training and combat missions than bombers. This creates a firmer tie to technology improvements in command and control systems such as AWACS and JSTARS. This in turn means that the evolution from bombers to fighters indirectly fosters further improvements in C4ISR since the fighter generals have been directly affected by the synergy of new fighter technology and C4ISR improvements.

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<sup>117</sup> The process can be likened to programming or getting used to a new cell-phone, although the consequences of mistakes can be more severe. For example, a District of Columbia Air National Guard F-16 (stationed at Andrews Air Force Base, Maryland) inadvertently strafed a public school near a gunnery range in New Jersey on the evening of 3 Nov 2004. The accident report faulted both the pilot and the software design since pulling the trigger in some modes lets the pilot use the targeting laser to verify his position from the target, and this was what the pilot was trying to do. However, since the pilot had already selected the air-to-ground gun mode and armed ready, pulling the trigger fired the gun. See Donna De La Cruz, "Report blames pilot in school strafing," Air Force Times 3 Jan 2005: 20.



### Weapons and technology

Technology has not only affected aircraft and the C4ISR system. It has had a major affect on weapons development, which in turn has radically altered the way war is fought. Aerial warfare traces its roots to the first attempts to use balloons to survey terrain and to observe enemy troop movements and emplacements. The human eye was the key to the surveillance operation. Military airplanes initially served as very mobile balloons, but during World War I they also became armed. Throughout World War I, however, the technology of combat airpower rested on the two pillars of the human eye and the pilot's ability to fly the plane. The human eye remained dominant in World War II and in Korea, although radar was used to control fighters intercepting enemy aircraft, range antiaircraft artillery (AAA) fire, and occasionally to aim bombs. In the air-to-air arena, air defense radars were used to direct fighters into a position from which they could visually acquire the targets and attack them. The weapon was still the gun, and it was still aimed by maneuvering the fighter. Bombers, their escorting fighters, or fighters flying combat air patrols, trolling for enemy fighters over enemy territory, were all beyond friendly radar range and, therefore, dependent on visually acquiring attacking enemy fighters. Although fighters might attack a bomber raid from the front, side, or rear, between fighters, the standard dogfight was marked by intense maneuvering as each fighter tried to get to the adversary's 6 o'clock (behind the tail) position. Since guns have rather limited range, this position provided longer periods for firing the guns than hit-and-run attacks from the front or side. In addition, it is difficult

to shake someone on your tail. Wingmen played an extremely important position in defending the leader.<sup>118</sup> Keen eyesight, flying skill and the ability to perform under stress were critical attributes for successful air-to-air fighter pilots.

In the air-to-ground arena, bombers depended on fighter escorts, chaff (aluminized reflective strips to overload the enemy radar), their own machine guns, darkness and luck to evade enemy fighters and AAA to reach their targets and drop their loads of free-falling unguided bombs. Although there was some use of radio signals and radar for navigation and target locating, bombsights were still primarily optical. Lead navigators and bombardiers had to get the raid to the right place, find the target visually, direct the formation to the bomb release point and call the drop. Fighters might strafe using onboard guns, or launch unguided rocket salvos, once again aiming the airplane. They might also carry various types of free-falling, unguided bombs. The pilots had to visually acquire their targets and determine that they were enemy personnel and equipment. In all cases, whether attacking troop columns, trains, bridges or other targets, fighters could expect fire from the enemy being attacked. Furthermore, whether making strafing, bombing or rocket attacks, the aircraft had to fly steady, predictable paths to ensure accuracy during attacks. Once again, keen eyesight, flying skill and nerve were critical attributes of a successful air-to-ground fighter pilot.

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<sup>118</sup> General Momyer reports that: "Almost all of these kills [USAF victories during the Korean War] were without the benefit of on-board radar even though the F-86 had a forward ranging radar. Most of the pilots used a fixed sight setting and got their kills from the 6 o'clock position with the six fifty caliber machine guns. Most of the fighter kills in World War II were also from the 6 o'clock position." See General William W. Momyer, USAF, Ret., Air Power in Three Wars (WWII, Korea, Vietnam) (Washington: Dept of the Air Force, 1978) footnote, 115.



By the late 1950s, however, airborne radars had advanced sufficiently to be used in bombers for navigation assistance and targeting, and in fighters for long-range searches and target selection. The development of air-to-air guided missiles that were tied to the fighter's radar and fire control system led to a potential beyond visual range capability in the air-to-air arena. Radar bombing also meant that certain targets, i.e., those that made good radar presentations on the scope, could also be bombed without ever being seen visually by the aircrew. The pilot's or aircrew's eye was no longer a limiting factor. These capabilities were sufficiently developed for use during the Vietnam War.<sup>119</sup> Electro-optical (television), infrared, and laser homing or steered glide bombs and missiles were also used during Vietnam. These systems had the effect of returning in a sense to a dependence on the pilot's or crewmember's eye, but this time the eye was assisted by television-type presentations with zoom capabilities to extend the eye's range. During the 1950s, several systems that did not require the pilot, let alone his eyes, were also developed or refined. The Air Force's surface-to-air missile

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<sup>119</sup> During the Vietnam War, however, the use of beyond-visual-range air-to-air missiles was limited by the Rules of Engagement (ROE) and the related need to identify targets before shooting. This frequently required pilots to visually identify enemy aircraft, which of course negated the advantages of beyond-visual-range capable missiles. In addition, radar bombing was limited to targets with good radar returns, which are limited in a guerilla insurgency in agrarian areas. Radar bombing depended on the radar operator's ability to discriminate between various radar returns, and the delivery of gravity ("dumb") bombs was not any more accurate when aiming at a radar return than at a visually acquired ground target. By Desert Storm, the combination of technology (new identification systems and AWACS radar coverage) lessons learned from Vietnam, and experience gained from years of combat exercises led to Rules of Engagement that minimized situations requiring visual identification of airborne targets and maximized opportunities for beyond-visual-range air-to-air missile shots. Technology in the form of the better airborne computers and algorithms in fighters and attack aircraft led to increased bombing accuracy for "dumb" bombs, and of course, the precision guided munitions (PGMs) epitomized the great technological strides in weaponry between 1973 and 1991.



and the long-range surface-to-surface missile, or the intercontinental ballistic missile (ICBM), became operational in the 1960s, and variations of the cruise missile concept continued to be refined. Radar and inertial navigation systems provided the guidance, and atomic warheads made up at least partly for navigational inaccuracies.

Consequently, by the end of the Vietnam War, the Air Force's foundation for precision guided munitions was established. The pilot or crewmember's eye and the pilot's flying skill needed no longer be the pillars of aerial combat.

Weapons used in aerial warfare are typically divided along the lines of their technology used or the environments or mediums in which they are deployed, as is the case in the standard categories of air-to-air, air-to-ground, surface-to-air, and surface-to-surface. However, for this manuscript it makes more sense to divide weapons into categories representative of crew involvement in terms of both technical skills required to deliver the weapon as well as decision-making skills with respect to acquiring and selecting targets, and determining the best employment techniques to maximize the chances of destroying the target. Weapons can then be classified in the following four categories. The first is aircraft-aimed weapons. The bullets, bombs or missiles go wherever the ballistic trajectory of the aircraft at launch takes them. The second deals with precision guided munitions (PGMs) that require operators to acquire the target, lock the system onto the target, and then either "fly" the weapon to the target or else keep radar or other energy directed at the target for the weapon to home onto. It is a "lock, launch and monitor" weapon. The third category involves PGMs that require

operators to acquire the target and lock the system to the target, but once launched, the weapon has no further contact with the launching platform or its systems. It is a "lock, launch and leave" weapon. The fourth category is one where the operators are never required to "see" or acquire the target. At most, the operators update coordinates or a flight path, then launch the weapon. The weapon is totally self-guided to the target. It is truly a "launch and leave" weapon.

In the first category, "aircraft-aimed weapons," the pilot or crewmember must visually acquire the target. Then the pilot must maneuver the aircraft to an optimum position to shoot or release weapons. Examples of this category include fixed machine guns or cannons in the wings or nose of an aircraft, "dumb" bombs and unguided rockets.<sup>120</sup> Aircrew may have some minimal technological assistance in terms of a bombsight or gun sight, or perhaps even a ranging-radar like in the F-86, but the crewmember is primarily responsible to determine the release point for bombs or when to fire rockets or the guns against airborne or ground targets. Guns in general, even those with sights integrated into the complex fire control systems such as in a modern F-15 and F-16, which incorporate radar information, winds and other factors, still fall in this category. Manual bombing modes with such systems also fall into this category. A high degree of flying skill is required, but once the bombs, rockets or bullets are away, the crew has no control over them and need not fly any prescribed path. The crew is

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<sup>120</sup> Perhaps the most exotic of these weapons was the AIR-2A Genie, an unguided, nuclear-armed air-intercept rocket carried primarily by the F-106. The AIR-2A was designed for use against Soviet bombers attacking North America. The pilot would fly into range of the bomber formation, point his nose where he generally wanted the AIR-2A to go and fire.

free to re-attack the same target, attack a new target, or depart the area. The flight path of the ordnance is subject to gravity, wind, launch conditions, and its own power, if it has any.

This category most closely aligns with the archetype of the heroic warrior. The delivery aircraft is integral to the weapon, and the pilot (and crew if there is one) is responsible for the entire process. Whether on an air-to-air or air-to-ground mission, the pilot or crew must navigate to the area, acquire the target, determine the best way to attack the target, and deliver the ordnance. Although there may be considerably more maneuvering in a fighter, a bomber pilot must be able to keep the aircraft under firm control and within parameters to have any hope of hitting a ground target with gravity bombs. There is minimal technical assistance, and no apparent micromanagement from the command and control system.<sup>121</sup> It could be argued, therefore, that the pilot and crew are demonstrating an expertise in the management of violence, at least in the case of their own aircraft or flight. Nevertheless, jurisdiction may be lacking. Just as the horse cavalry disappeared after it lost all semblance of any effectiveness or efficiency in battle, an air force officer corps that pursued ineffective and inefficient means of battle would lose the confidence of the public and government. Although there are still roles for both conventional and nuclear gravity bombs and fixed guns beyond the A-10 case, no heroic warrior would advocate an aircraft that can only use gravity bombs or an

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<sup>121</sup> Although there might not appear to be any obvious command and control (C2) system involvement, B-52s in Southeast Asia were routinely controlled by special ground radar sites, which set the bombers' course, altitude, speed, and bomb drop when B-52s were bombing close to American ground forces.



internal gun in combat. All late model F-4s and follow-on Air Force fighter aircraft were equipped with an internal gun because situations occurred in the Vietnam War where it might have been possible to attack Migs with a gun but not with missiles or the missiles did not operate correctly. Nevertheless, there is no gun on the F-117 stealth fighter since it would ruin its stealth characteristics. Heroic warriors appreciate technology.

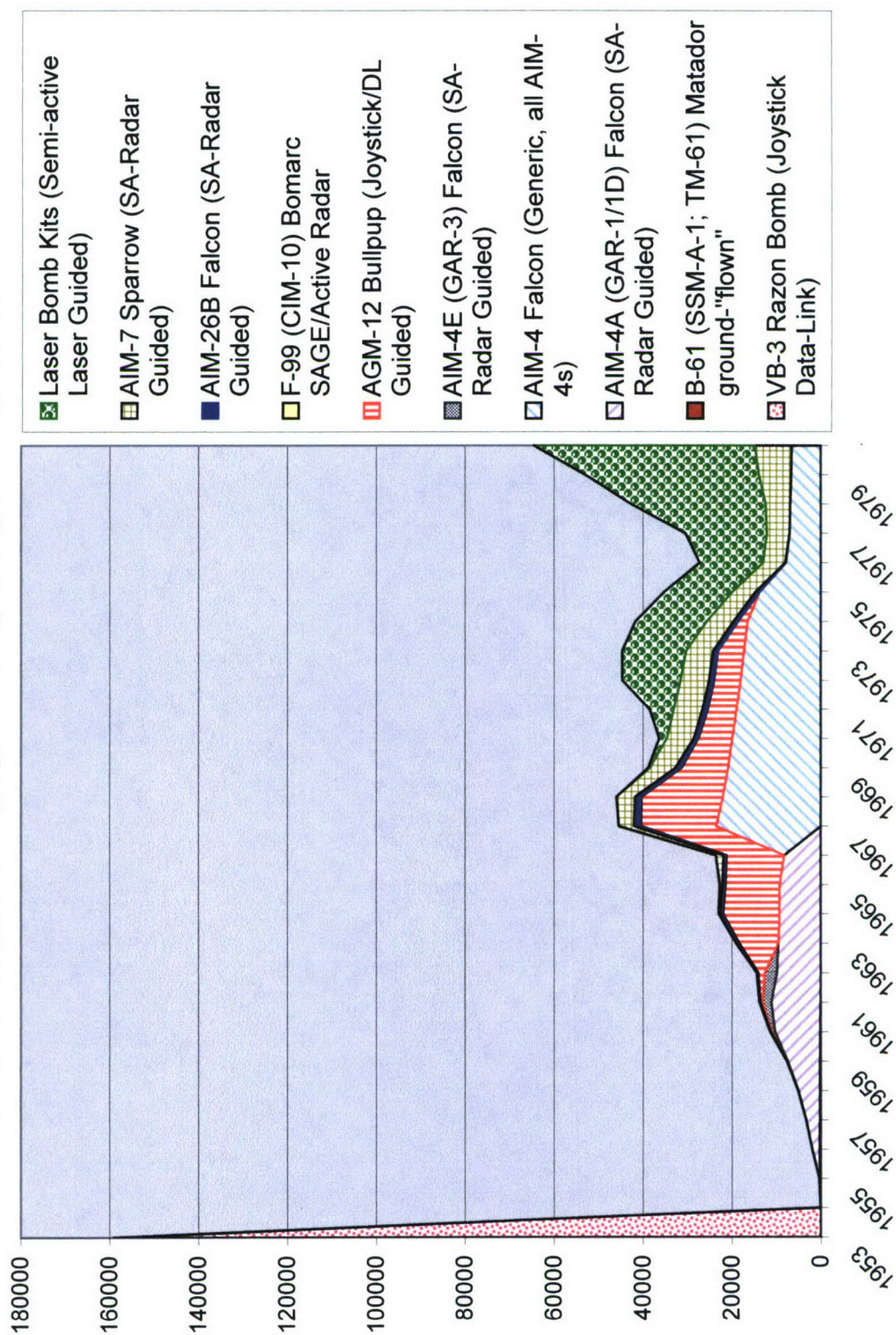
The second category of PGM “lock, launch and monitor,” consists of systems in which a crewmember must actually “see” the target, “lock” the system or weapon on the target, and take action to maintain the “lock” or “fly” the weapon into the target. This category can apply to ground-based systems such as SAMs, as well as to airborne weapons. A crewmember or operator could “see” the target visually through the cockpit canopy or via a television, radar or infrared screen. “Locking” the target means that the weapon system requires some sort of designation of the correct target and some period of tracking the target before, during or after firing the weapon. With a flexible gun, the gunner must adjust the gun as the target flies by to keep the target in his sights. With a semi-active radar missile, the firing system’s radar must continue to periodically scan the target so that there are sufficient radar returns for the missile to follow until it hits the target, or comes close enough for its proximity fuses to work. With a data-link command system, the control system must continue to track the target and the missile and either send that information to the missile for its internal intercept calculations or compute the intercept and send course corrections to the missile. With laser-guided

bombs, the firing aircraft or another aircraft or person on the ground must maintain the laser on the target after an aircraft launches a laser-homing weapon. In an airborne system, some degree of flying skill is still required since the pilot must maneuver the aircraft to get the target into the weapon's firing envelope, and perhaps execute maneuvers to keep the target locked on. However, the envelope is typically larger in this category of weapon than in the first. Examples of this category include the VB-3 Razon bomb, AGM-12 Bullpup air-to-surface missile, the various laser-guided bombs, and the AIM-7 semi-active radar air-to-air missile. Chart 5-7 (Weapons Category 2: PGMs, Lock, Launch, and Monitor) shows the Air Force officer corps' early and visionary interest in these types of weapons, as well the diversity of weapons that fall into this category. Although the Razon and its predecessors were used prior to 1953, the FY1953 USAF Statistical Digest contained the first reporting on the Razon. After the Razon came the TM-61 Matador ground-flown surface-to-surface missile or unmanned bomber in FY1953, whose 300-odd missiles in FY1956 were eclipsed by the 1,500 AIM-FA Falcon air-to-air missiles. By FY1980 the Air Force had somewhere between 58,000 and 65,000 Category 2 weapons in the inventory, depending on the actual breakout of the AIM-4A and AIM-4B air-to-air missiles.

The "Lock, Launch and Monitor" category of PGMs has a long-standing tradition in the Air Force. Visionaries in the Army Air Force embraced this type of technology during World War II, supporting research into a series of different types of controlled bombs, which were the forerunners of contemporary guided glide bombs.



**Chart 5-7: Weapons Category 2: PGMs, "Lock, Launch, and Monitor"**





However, only the radio-controlled VB-1 *Azon* saw combat. The VB-1 was used in Europe and in the Mediterranean, as well as in the China-Burma-India Theater, where it had its most success, destroying 14 bridges in seven missions.<sup>122</sup> This figure indicates that there were multi-target missions per raid, if not per aircraft, almost 45 years earlier than Desert Storm. Bridges were very difficult to hit with regular bombs because of the large Circle Error Probable (CEP) associated with them.<sup>123</sup> Bridges are important targets because they form natural transportation chokepoints, and destroying them exacerbates logistics problems for the enemy. Supplies cannot flow until the bridge is repaired, or they must be taken back and moved over different routes. This leaves enemy forces without immediate supplies. Furthermore, it makes the supplies more vulnerable to follow-on attacks as they sit near the bridge waiting for repairs, or are moved to alternate routes, which are then more crowded. Consequently, successfully attacking bridges can be very effective and efficient. It also easily fits within Air Force officer conceptions of both strategic bombing and tactical battle area interdiction. The use of the VB-1 also highlighted the visionary aspects of aerial warfare, including precision, relative bloodlessness, limited collateral damage, and striking targets to create desired and synergistic effects.

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<sup>122</sup> "VB" stands for *Vertical Bomb*; "AZON" stands for *Azimuth Only*. The bomb could only be steered left or right (azimuth), but not up or down (range). The VB-1 was a 1,000 lb. bomb with a tail assembly containing radio-controlled rudders that made it possible to "fly" the bomb into the target. The VB-1 carried a flare in its tail, which the bombardier used as a reference point in steering the bomb toward the target. See "VB-1 Azon Guided Bomb," US Air Force Museum Weapons Gallery, Wright-Patterson AFB, Ohio, 11/7/2005 <<http://www.wpafb.af.mil/museum/arm/arm34.htm>>.

<sup>123</sup> Circle Error Probable (CEP) refers to the radius in which 50% of the ordnance can be expected to fall.

The VB-3 *Razon*, a derivative of the VB-1, did not see combat in World War II, but was used in Korea, with some success destroying bridges.<sup>124</sup> After the *Razon*, the next major Air Force operational conventional guided air-to-surface weapon was the AGM-12 Bullpup. The Bullpup actually was developed by the Navy, and the Air Force accepted its first Bullpup missiles in 1960. The Bullpup was powered, and was “flown” into the target by means of a joystick that generated data-linked commands to the missile. It had a range of roughly seven miles, giving the launch aircraft important stand-off range, which was countered to an extent by the need to visually “fly” the missile to the target.<sup>125</sup> Although the Bullpup continued in service through the mid-1970s, the Air Force began moving to laser-guided bombs during the Vietnam War. These bombs are “semi-active” laser-homing, meaning that the launch aircraft, another aircraft, or person on the ground must illuminate the target with a properly coded laser

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<sup>124</sup> “RAZON” stands for *Range and Azimuth Only*. This bomb had range and azimuth controlling surfaces. The 19<sup>th</sup> Bombardment Group had to overcome several problems in its use of the Razon. Razons were used for the first time on 23 August 1950. Three B-29s attacked the Pyongyang railway bridge with 15 Razon bombs, but only one of the bombs stayed under control and registered a hit. The bombers apparently flew over the area for 40 minutes—an amazingly long time—as they tried to acquire the target, make a bomb run, release a Razon, and try to steer it to the bridge. One B-29 was hit by North Korean AAA. Subsequent groupings of missions yielded statistics of roughly 30%, and later 60% of the released Razon bombs being controllable. Of course, not all controlled bombs actually hit their targets, since there was obviously an art to steering the bomb, with no references except a flare, falling three or more miles below. Since it often took multiple hits to destroy bridge segments, the USAF tried a further development, the 12,000 lb VB-13 *Tarzon*. The *Tarzon*, also known as the ASM-1, was used in Korea to destroy bridges between December 1950 and April 1951, when it was withdrawn because of safety concerns and a low success rate. See: “Razon-Tarzon,” Wright-Patterson AFB, Ohio, 11/7/2005 <<http://www.ascho.wpafb.af.mil/korea/tarzonRazon.htm>>; Albert Simpson and Robert Futrell, “Interdiction – Razon Attacks,” United States Air Force Operations in the Korean Conflict, 25 June – November 1950, USAF Historical Study No. 71 – USAF Museum, 1 Jul 1952, Wright-Patterson AFB, Ohio 11/7/2005 <<http://www.wpafb.af.mil/museum/history/korea/no71-55.htm>>; and “VB-3 Razon Guided Bomb,” US Air Force Museum Weapons Gallery, Wright-Patterson AFB, Ohio 11/7/2005 <<http://www.wpafb.af.mil/museum/arm/arm35.htm>>.

<sup>125</sup> Bill Gunston, ed. The Encyclopedia of World Air Power (New York: Crescent Books, 1981) 369.



while the bomb is in the air, homing onto the reflected laser returns coming from the target.

The laser-guided bombs fundamentally altered the responsibility (command and control) over a bombing mission, at least in certain circumstances. In the past, whether working with a FAC or not, the pilot or bombardier on board the aircraft had to find the target, position the aircraft within the weapon's parameters, then aim, release and perhaps track the bombs. Now someone else, off board, could select the target and designate it with the appropriate laser as the bomb homed in. The pilot (or bombardier) flying the launch aircraft was relieved of the responsibility to find the target, evaluate the target, and hit the target. Instead, he only had to launch the laser-guided bomb within the parameters necessary to get it to the target. When the laser designator was either a FAC flying over the target area or on the ground with the troops, the command and control system deliberately shifted these targeting responsibilities and decisions away from the raiding aircraft itself to the people with the best tactical situational awareness and most self-interest in a successful strike.

In the air-to-air arena, the Air Force began development work on the GAR-1, later redesignated AIM-4A Falcon, in 1947 and was testing versions of the missile during the Korean War. However the Air Force did not begin accepting the first operational Falcon missiles until 1955. It became the world's first operational guided



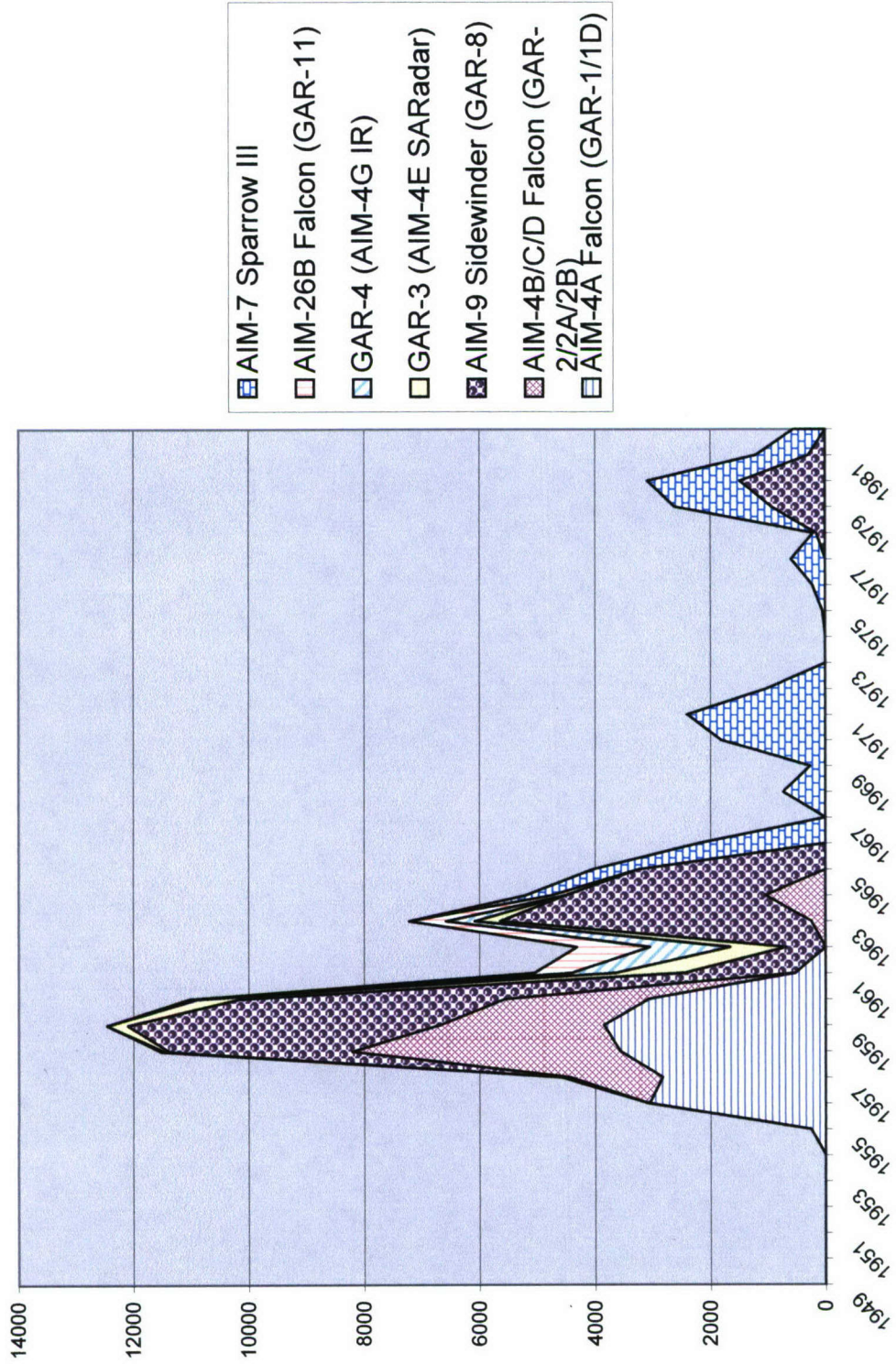
air-to-air missile in 1956.<sup>126</sup> The Air Force officer corps was not reticent about moving from the gun to air-to-air missiles, having accepted over 2,800 AIM-4As in FY1957. See Chart 5-8 (Operational Air-to-Air Missiles Number Accepted per Year (1949-1982)). The AIM-4A was a semi-active radar guided missile, which meant that the launch aircraft had to lock the radar on to the target so that sufficient radar energy bounced off the target for the missile to track. Consequently, the pilot had to maneuver the plane in such a way that the target stayed within the fighter's radar coverage. The missile was designed for the air defense fighter-interceptor force, which would be attacking bombers flying relatively straight and level; so it was not particularly maneuverable. It was not a dogfight missile. However, the missile could be fired from any aspect, i.e., from the front, side or rear of a target, and with a radar lock-on, the pilot did not need to visually acquire the target. Consequently, it could be fired day or night, or in inclement weather, and most important, the range of effectively engaging a target jumped overnight from thousands of feet to miles, making it potentially a "beyond visual range" weapon, i.e., the enemy aircraft might never visually see the launching aircraft. The AIM-4 Falcon semi-active radar guidance missile went through several iterations and remained a mainstay on Air Force long-range fighter-interceptors (e.g., the F-101, F-102, and F-106) until their demise in the early 1980s.

However, for tactical fighters, the AIM-7 Sparrow III was the Air Force's main semi-active radar guidance air-to-air missile. The AIM-7 was developed by the Navy in

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<sup>126</sup> Encyclopedia of World Air Power, 368. Almanac of Airpower, 196.

Chart 5-8 Operational Air-to-Air Missiles Number Accepted per Year  
(1949-1982)





conjunction with the F-4 and entered service with the Navy in 1958. The Air Force began receiving its first operational AIM-7s in 1964. Having semi-active radar guidance, the AIM-7 Sparrow also required a radar lock on the target to ensure enough radar energy to home on. However, the Sparrow was more maneuverable, and has been modified over the years to increase its range and ability to resist ground clutter and enemy electronic countermeasures.<sup>127</sup> The AIM-7 had (and has) true “beyond visual range” capability, but two things are required before this capability can really be exploited. First, the fighter’s radar must acquire the target and lock-on to it.<sup>128</sup> Second, the Rules of Engagement (ROE) must permit beyond visual range firings as they did in Desert Storm as opposed to Vietnam.<sup>129</sup> This limitation is at least partly political. In

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<sup>127</sup> *Encyclopedia of World Air Power*, 372. *Almanac of Airpower*, 83-84.

<sup>128</sup> Fighter radars project a small, but normally steerable cone of coverage forward from the nose of the aircraft. In air-to-air modes, the radar is typically scanned in an overlapping raster pattern something like a LED “2.” The pilot or weapons system operator sets the pattern and direction, and range of the radar scan. The radar only “sees” targets that reflect sufficient radar energy back to the antenna and meet other parameters. Consequently, aircraft to the sides and rear of a fighter are not “seen” by its radar. Aircraft that are too far away or are facing certain directions may not reflect enough energy to be projected on the scope, and aircraft that are flying at an altitude of 30,000 feet when the radar is looking lower or higher do not get hit by the main radar beam and hence are invisible to the radar. In addition, setting the radar to scan the entire gamut of possibilities from 50,000 feet in altitude down the surface, from 60° left of the fighter’s nose to 60° right of the nose would take such a long time that an enemy aircraft could be beyond the processing range when first hit by the main beam, but be in firing position before hit again. Finally, in most fighter systems through the 1980s, locking on to one target with the radar left the pilot “blind” with respect to all other radar targets. Although fighters working in pairs could split the search and condense it in terms of altitude or azimuth because of known enemy tactics, radar-equipped fighters are in many ways still looking for the proverbial needle in the haystack while searching for enemy aircraft. In Vietnam for example, an F-4 might be able to detect aircraft at 30 or so nautical miles, depending on a variety of conditions. However, detecting an aircraft at 30 nautical miles is not the same as identifying the aircraft at 30 nautical miles, and even if an aircraft could be identified at 30 miles, the AIM-7’s tactical range was closer to 10 miles. Locking on to the target too early left the fighter blind to other radar returns; so there was no point to locking on to aircraft that were well-beyond missile range. It only served to alert them that they were being tracked.

<sup>129</sup> In Vietnam, the Rules of Engagement did not permit beyond-visual-range engagements, at least until the 1972 air campaign, partly because the command and control radar networked coverage contained



addition, it also ties back to the command and control system since fighter radars are limited in coverage and somebody has to have the authority to declare radar blips as hostile before they can be shot beyond visual range.

Consequently, the “lock, launch and monitor” category of PGMs did not free pilots from the C4ISR system. In fact, the reverse was true. Air-to-ground missions required better intelligence to be able to quickly and accurately find, identify, lock, and maintain the lock on the target. The idea was no longer to send a bunch of airplanes to fill the target area CEP with bombs and hope a few actually hit the target. The concept had changed to a small flight of aircraft with a high probability of hitting the target.

Aim points also became critical as accuracy increased. One or two small bombs

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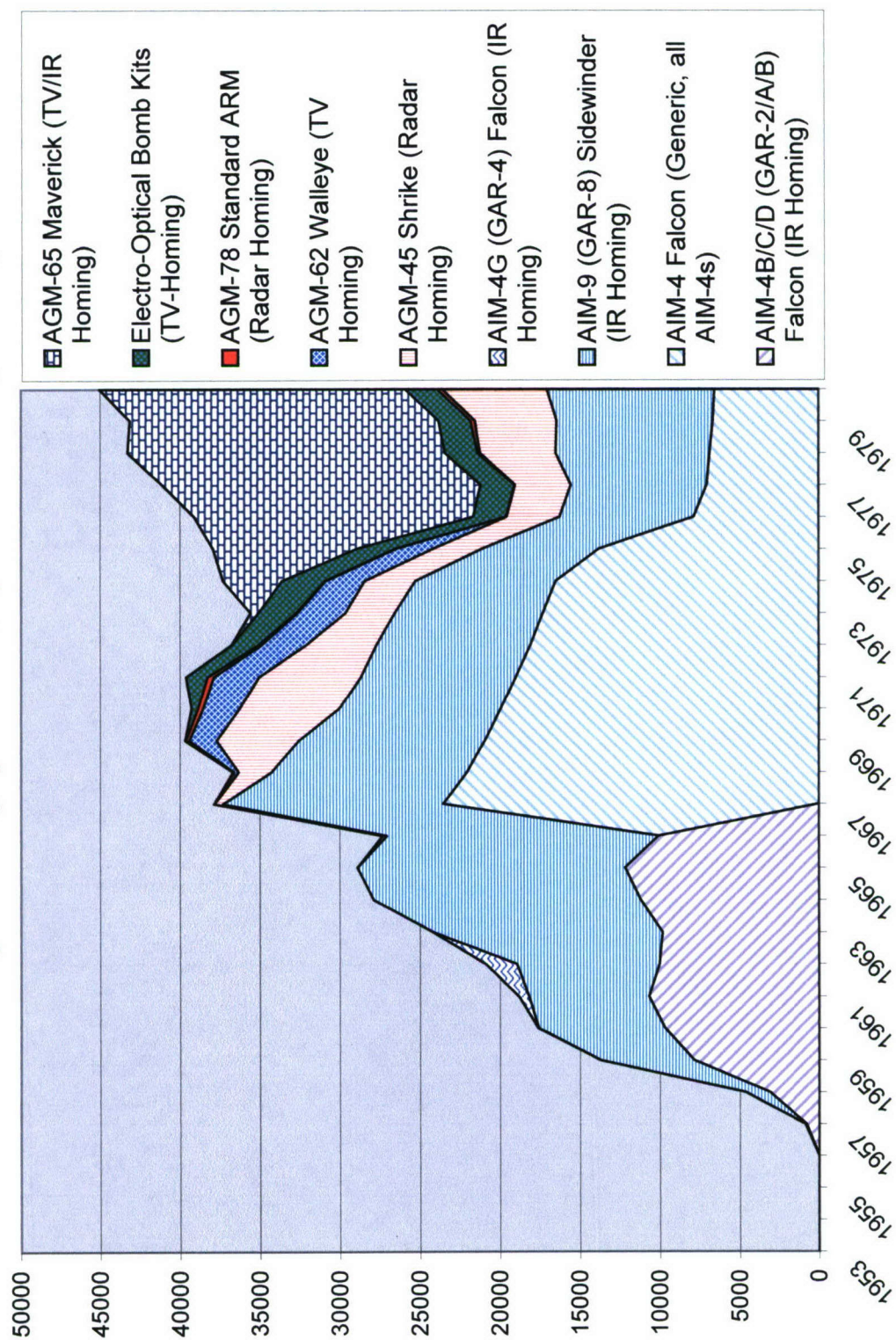
many holes, into which both friendly and enemy aircraft could disappear. Momyer, 158. Consequently, in order to prevent fratricide, in the majority of fighter engagements during the war, the fighters had to visually identify the target before firing missiles or guns at it. The requirement for visual identification kept the responsibility and decision-making for air-to-air engagements with the pilot. However, it negated the superior range, all-aspect and beyond-visual-range capability of the AIM-7/F-4 combination over the Mig-21's short-range, rear-aspect only, visual range Atoll missiles. In addition, it yielded the initiative to the enemy aircraft in any engagement since the American fighters had to get close enough to visually identify the enemy aircraft, while trying to maintain the ability to fire weapons as soon as the identification was made. However, they could conceivably get too close to the Mig during the identification to fire the AIM-7, which required a minimum range to arm the missile, and the F-4 did not have an internal gun until the F-4E model. Meanwhile, the Migs were under ground-controlled intercept (GCI) control, which had a comprehensive radar picture of the airspace over North Vietnam. The North Vietnamese command and control system could keep the Migs from being surprised by American fighters, determine the Migs' targets and direct them on the intercepts. Consequently, the Migs were frequently able to fly up, shoot and run, before the American aircraft could react and counterattack. The combination of the Rules of Engagement and the spotty command and control system coverage limited the effectiveness of the Air Force's use of semi-active radar missiles over Southeast Asia. These issues were not factors in Desert Storm, however. In addition, the development of the Track-While-Scan modes in certain fighter fire-control computers permits a pilot to lock onto an aircraft without becoming blind. The radar can continue to scan and detect other targets while locked on to one. Furthermore, the Advanced Medium Range Air-to-Air Missile (AMRAAM) now gives certain fighters the capability to simultaneously attack multiple air targets at beyond-visual-ranges. It should also be pointed out that the requirement for a visual identification was not really an issue in Korea or World War II because the primary air-to-air weapon was the gun. Its effective range was within visual range; so all targets were *de facto* visually identified.

accurately hitting the wrong part of a building might have no affect on the target's ability to operate. Intelligence had to meet this new requirement. In addition, the ability of a FAC or person on the ground to designate targets took the target identification and aiming out of the cockpit and placed it in the C4ISR system. In the air-to-air arena, the longer-range command and control radars and the C4ISR system told fighters where to look for enemy aircraft, played a role in sorting out friendly and enemy aircraft, and enabled beyond-visual-range shooting.

The third category of "lock, launch and leave" is similar to the second, except, that after locking the weapon on the target; the weapon is "launch and leave." For example, with a heat-seeking or anti-radiation missile, control systems must ensure that the missile is targeted at the correct target and that the target is within parameters before launching. Once the weapon is away, however, there is no external control over the weapon. Examples of this category include the AIM-9 infrared heat-seeking air-to-air missile, the AGM-65 Maverick television-guided air-to-surface missile, or the AGM-45 Shrike radar-homing missile. Chart 5-9 (Category 3 PGMS, Operator Lock-On, Launch and Leave) shows the Air Force officer corps's move into this category in FY1957 and the rapid rise in the number of this type of weapon. The Air Force stocks rose from over 800 AIM-4B infrared air-to-air missiles in FY1957 to somewhere between 38,000 and 45,000 Category 3 weapons, depending on the actual AIM-4 breakout, by FY1980. Many short-range SAMs also fall into this category. "Smart" aircraft with dumb bombs, as was the case with the F-16s in Desert Storm, also fall into this category. In



**Chart 5-9: Weapons Category 3: PGMs, Operator Lock-on, Launch, and Leave**





certain modes, for example, the pilot can designate the ground target. The fire control system then computes the optimum flight path, and releases the selected munitions when it, the fire control system, determines. In an airborne system, pilot demands are less than the previous category since there is no requirement to keep the aircraft in a specified relationship to the ordnance and/or target once fired.

The Air Force came out with what was later designated the AIM-4B Falcon shortly after the AIM-4A semi-active radar air-to-air missile. The AIM-4B was the Air Force's first infrared (IR) guided air-to-air missile. Air-to-air infrared missiles have a seeker in the nose that tracks infrared energy from jet engine exhausts. The missile seeker can typically search for targets on its own, be slaved to the radar to search for a target that the radar has locked on, or bore-sighted through the front of the aircraft. Once it is clear that the infrared missile has acquired the correct target, and the target is within range parameters, the missile can be launched. Once launched, the seeker leads the missile to the target.<sup>130</sup> The AIM-4B was designed to be carried by fighter-interceptors against bombers, so it was not a dogfight missile. However, the Air Force procured the AIM-9 Sidewinder, originally developed by the Navy, and the AIM-4D infrared missiles, both of which were designed to handle the maneuvering engagement typical of a dogfight between two or more fighters. Both versions were used in

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<sup>130</sup> Early versions of air-to-air infrared missiles could only be fired from the rear of the target since the seekers were not extremely sensitive. From the 1980s onward, many infrared guided air-to-air missiles can also be fired from the front or side of a target, making them all-aspect missiles. They typically have a longer range in the front since the target is coming to meet the missile, but they are still short-range, i.e., within visual range, missiles.

Vietnam, although over the long run, the AIM-9 Sidewinder became the Air Force's standard fighter (e.g., F-4, F-15, F-16) short-range infrared missile.

The earlier, rear-aspect-only versions of the air-to-air infrared missiles had many attributes that were more representative of the heroic warrior archetype than of the visionary. First of all, being rear-aspect and close range, they required a high level of pilot skill to maneuver behind an adversary and get into a firing position. Although the missile's envelope was typically larger than that of an onboard gun, there was some overlap. It was very popular among pilots to limit the simulated weapons in a training engagement to a "knife fight" with only infrared missiles and guns, with the winner having bragging rights at the bar. In addition, because of the rear-aspect limitation, the missile fusing characteristics and infrared countermeasures, an early infrared missile was more likely to damage or destroy the adversary's aircraft without killing the pilot in combat than a semi-active radar guided missile fired into the front of an adversary aircraft. This linked the infrared missile's requirement for pilot skill with an allusion to early chivalrous World War I dogfights and indirectly to the knights of yore. The heroic warrior perspective was also furthered by the fact that in the F-4, which was a two-seat fighter, the AIM-9s could be fired without the weapons system operator's assistance.<sup>131</sup> The AIM-7 semi-active radar missiles required both crewmembers.

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<sup>131</sup> In the Air Force, the F-4 was initially manned by two pilots, with the front-seater being the *aircraft commander* and the rear-seater the "guy in back" (GIB). However, the increasing demand for pilots during Vietnam, and a general unwillingness of pilots to perform the GIB's duty of running the radar and weapons control system resulted in the move to man the back seats with weapons system operators (navigator specialty). The transition actually lasted several years. See "Pilots to Leave F-4 Rear Seats,"



Nevertheless, in Vietnam, over half the Air Force air-to-air kills were made with AIM-7 Sparrows.<sup>132</sup> The longer-range, all aspect ability of the Sparrow was more effective against Mig-21s employing high-speed hit and run tactics since the Sparrow could run the Mig down in certain circumstances. Downing the Mig was more important than upholding the warrior image and missing the kill.

In addition to air-to-air missiles, category three also includes anti-radar missiles. The Navy began development of the AGM-45 Shrike radar-homing missile in 1961, and the missile became operational with Navy aircraft in 1964. The Air Force began receiving and using operational missiles in Southeast Asia in 1966. The joint Navy-Air Force AGM-78 Standard ARM (Anti-[radar] Radiation Missile) became operational and was used briefly in Southeast Asia in 1968. Its numbers never rivaled those of the Shrike in Vietnam, but it did have additional program algorithms to keep it on course to the radar site, even if the radar was shut down while the Standard ARM was in-flight to the radar. This capability rectified a problem with the Shrike that the North Vietnamese had quickly learned to exploit—the Shrike would go ballistic and usually miss the radar site if it lost the enemy radar signal in flight. Degrading or destroying the enemy's command and control system became a critical prerequisite for effective and efficient

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*Air Force Times*, Vol. 31 No. 15E, 18 Nov 1970: 8. Nevertheless, two of the Air Force's three Vietnam War aces were actually weapons system operators.

<sup>132</sup> On the other hand, Navy aviators achieved most of their kills in Vietnam with the AIM-9 Sidewinder missile. Gen Momyer attributes the difference to the fact that the Navy routinely worked in areas where they were attacked by Mig-17s, which were less capable than Mig-21s and forced to close in to gun range to shoot down US aircraft. Consequently, the engagements were at very close range, and as the Navy F-4s did not have guns, their short-range weapon was the Sidewinder. See Momyer, p. 157.



use of the air medium. Anti-Radiation Missiles continue to be important. The HARM, or High-Speed Anti-Radiation Missile added speed to the missile's flight. It is critical for Wild Weasel aircraft, designed to detect and destroy enemy Surface to Air Missile (SAM) sites, to not only detect and engage, but most important, to destroy critical parts of a SAM system before the SAM hits the trolling Wild Weasel aircraft. Technology is indispensable in this modern game of chicken. The enemy command and control system must be degraded, suppressed or destroyed via electronic jamming, bombing, or information/computer attacks before aircraft can freely roam over enemy territory.

The "lock, launch and leave" category did not significantly alter the relationship between combat aircraft and the C4ISR system beyond that already seen in the "lock, launch and monitor" category with respect to air-to-ground and air-to-air warfare. The C4ISR system was most important in the target identification and selection phases of an engagement. The ability of the pilot to leave instead of monitoring reduced the demands on pilot skill. The addition of the anti-radiation missiles placed new burdens on intelligence, while simultaneously moving in the direction of more active anti command and control warfare.

The fourth category of PGM "launch and leave" is often thought of as a high-technology weapon. However, this need not be the case. In fact, the "Air Force's" first such weapon was developed in World War I. The Kettering Aerial Torpedo, known more affectionately as "the Bug," was the forerunner of the German V-1 flying bomb and cruise missiles in general. It was an unmanned biplane filled with explosives,

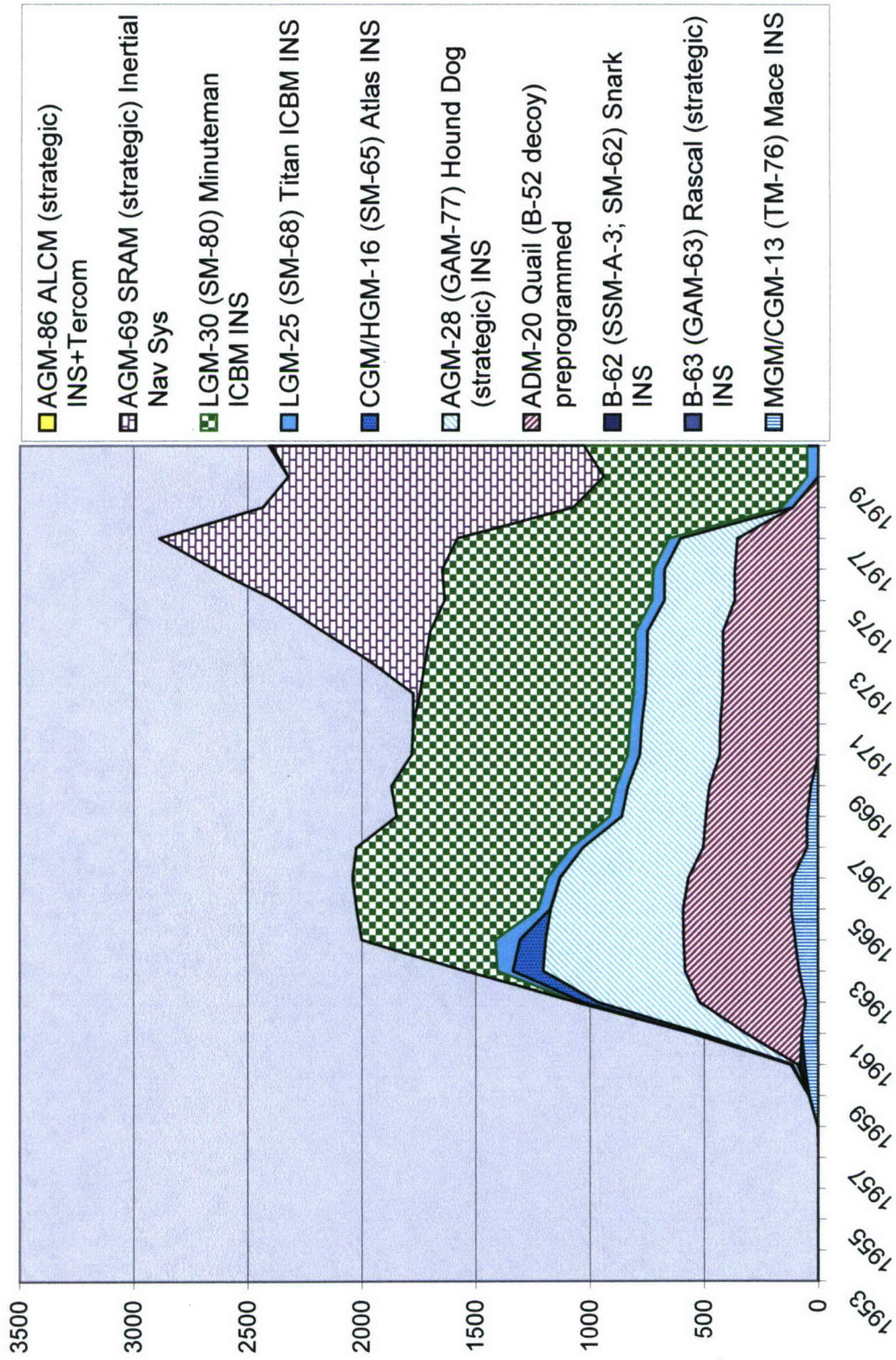
launched from a dolly riding a track, and with a range of 75 miles.<sup>133</sup> The ground crew would set up the rail track, which provided direction. The Bug would be prepared for flight, and its timer would be set, which translated to the target's range. At the set time, the motor would shut down, the wings would drop off, and the Bug would dive to the ground. Although the war ended before the Bug could be used in combat, the concept illustrates the pure "launch and leave" category of weapons, although the "precision" aspects of the Bug are open to debate. Unlike the other categories, crewmembers are not required to acquire or "lock" the target in any way. The target need never be seen, even with radar. Operators may need to load target information, which with the Bug was simply direction and range. Today, target coordinates, terrain maps or flight plans may be preloaded, or uploaded shortly before launching the weapon. However, once the weapon is fired, its own navigation systems steer it to the target. Examples of this category include ground-launched cruise missiles (GLCMs), air-launched cruise missiles (ALCMs), the Joint Direct Attack Munition (JDAM) family of inertial navigational system (INS)/Global Positioning System (GPS)-guided munitions. It also includes most, but not all surface-to-surface missiles, including of course ICBMs. With an ALCM or JDAM, the mother aircraft transports the weapon to a point inside the weapon's range and launch envelope for a given target, but there is no particular piloting skill required to launch the weapon. Chart 5-10 (Weapons Category 4: PGMs Operator Launch and Leave) once again shows the officer corps' early and substantial

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<sup>133</sup> Almanac of Airpower, p.195. Hap Arnold was involved in the "Bug's" development.



Chart 5-10: Weapons Category 4: PGMs, Operator Launch and Leave





commitment to Category 4 weapons, having 40 TM-76 Mace tactical surface-to-surface missiles already in FY1959.

The launch and leave weapons of category four are important for a variety of reasons. First of all they tend to provide great standoff ranges, thereby increasing the survivability of aircrews or missile launch crews. In addition, they reduce the need for pilots, crewmembers and operators to develop specialized skills. Neither pilot nor bombardier must try to positively identify the target through radar, television, or infrared imagery while flying in combat conditions. There is no need for a pilot to undertake any special maneuvers to obtain a lock-on of the target, no need to limit maneuvers in order to keep the lock-on, and no particularly demanding pop-up or diving maneuvers required to launch the weapons. Furthermore, the onus of target selection falls to the command and control system. It is no longer a pilot, crew or operator decision. It is entirely possible that, for example, a Special Forces team under fire will set and send the coordinates for JDAM strikes to crewmembers in aircraft flying nearby, who have no insight into the targets or battle situation below. Consequently, the locus of control or targeting decision-making is swinging dramatically from the pilot to the command and control system. This, of course, leads to a final point. The command and control system is more dependent than ever on accurate and up to date intelligence.

### Conclusion

Technology is making aircraft better. Today's generation of combat aircraft can generally fly higher, faster, further, and more safely than its predecessors.

Operationally, they can bomb more accurately, even with dumb bombs. In the air-to-air arena, fighters clearly have beyond-visual-range capabilities with the AMRAAM, AIM-7 Sparrow, and in some instances even with the AIM-9 Sidewinder missile. In addition, on-board technology, the command and control system, and the ensuing rules of engagement now tend to make this capability a reality in combat operations. PGMs, with better stand-off ranges and the launch and leave capabilities of JDAMs, HARMs, and conventional armed cruise missiles dramatically increase aircrew survivability. However, each step away from the basic gun is a step towards more intrusive command and control system involvement. Each step is also a step towards potential unmanned air combat vehicles (UCAVs) as more of the flying and combat phases are computed and controlled by computers and electronic presentations that can be data-linked off-board. Although it can be argued, as the Gulf War Air Power Summary does, that there still is a place for B-52 carpet bombing of enemy ground combat units, and A-10 fans say that there is nothing like its 30mm gun, the trend is clearly toward PGMs.<sup>134</sup> And it is not just toward generic PGMs, but the PGMs in my fourth category—the launch and leave weapons, which place the lowest demands on piloting skills. The heroic warrior cannot use his gun in most air-to-air situations. An enemy fighter would kill him with a beyond-visual-range missile while he was still just a dot on the radar scope. Enemy

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<sup>134</sup> The Gulf War Air Power Survey makes the case that using PGMs to attack individual tanks in Iraqi Republican Guard and Army units would have been too time-consuming and expensive. Furthermore, massive bombardment, or carpet bombing ground units with dumb bombs creates a psychological atmosphere of terror or panic, which can lead to the breakdown of morale and discipline in some units. See "Weapons, Tactics and Training," Gulf War Air Power Survey Volume IV (Washington: GPO, 1993) 261-266.

SAMs will do the same thing unless they are jammed or diverted by automatic on-board systems or other specialized aircraft. Heroic warriors understand this and realize that they cannot survive without relying on modern technology and modern weapons, which indirectly creates a greater reliance on the C4ISR system.

Although heroic warriors realize that they cannot compete and meet their social responsibility to defend the nation in older, more heroic aircraft, the review of weapons technology indicates that Navy air was often more visionary than the Air Force officer corps in the tactical air jurisdiction. For example, the Navy developed the F-4 fighter, the Bullpup air-to-surface missile, the AIM-7 Sparrow tactical air-to-air missile, the AIM-9 Sidewinder dogfight air-to-air missile, and the AGM-45 Shrike anti-radar missile. The Air Force eventually purchased and used large numbers of these Navy-developed technologies. The F-4, armed with the AIM-7 and AIM-9, became the Air Force's frontline fighter for a generation, and the Air Force used that combination as well as Bullpups and Shrikes in Vietnam. Part of the Air Force officer corps' less than visionary approach to these rather important technical advances lies in the jurisdictional divisions of the 1950s. The Air Force officer corps' clear priorities were strategic offense and strategic defense. Consequently, its investments were directed in these jurisdictions. For example, the Air Force AIM-4 Falcon air-to-air missiles were designed for strategic defense interceptors to use against non-maneuvering bombers. This was a simpler technical problem than dogfight-capable missiles, and the AIM-4 was operational long before the AIM-7. Navy air, having no jurisdiction for strategic



air defense or strategic bombing, could direct all of its investment into its tactical air mission. On the other hand, since naval air is but one of several communities competing within the Department of the Navy and because space is a very limiting factor on a carrier, naval air is perhaps driven more towards the visionary perspective in order to maximize its effectiveness and efficiency. When defending the carrier, the objective is to destroy enemy aircraft as far away and as quickly as possible. Dogfights are bad. They take time, and increase risk. When attacking ground targets, the objective is again to shoot from as far away as possible to minimize the risk to the aircraft and to minimize flight time. Time is important because take offs and landings must be choreographed into a tight, almost unalterable schedule. Risk is important, because there are no spare aircraft on the carrier. The Air Force officer corps, blessed with more aircraft and more time, was perhaps more able or willing to tolerate the heroic warrior archetype and less visionary tactical weapons, at least until Vietnam made it clear that what was once visionary, had moved to the category of necessity.

From the visionary warrior's perspective, the Air Force's use of camera clips of PGMs hitting targets so perfectly in Desert Storm, in the Balkans, and in Afghanistan and Iraq has contributed to the public's awarding of a jurisdiction of sorts on precision in warfare to the Air Force. Concurrently, however, this has raised public expectations that survivability and accuracy will continue to increase and that collateral damage will continue to decrease. Although this requires the officer corps to continue to improve its weapons, it places a bigger burden on the C4ISR system to find, identify and orchestrate

attacks on specific targets. It also carries an inherent endorsement of the effects-based operations concept. Carpet bombing causes immense and random destruction and wreaks havoc, chaos, panic and terror. Precision attacks on a relatively small number of targets can only be effective if the attacks result in a specific and predictable effect. This in turn, places a new requirement on the C4ISR system. It must be able to overcome cultural and technological divides and reasonably predict the fallout from different attack scenarios.

As the precision of weapons increases, the number of aircraft, bombs or missiles required to suppress, damage or destroy a particular target has decreased. As then Brigadier General David Deptula pointed out in 2001, a one thousand B-17 aircraft raid in World War II attacked a single, somewhat broadly defined target and had a CEP of 3,300 feet. A “dumb” bomb attack against a single target during the Vietnam War would require a “package” of 30 F-4s, and had a CEP of 400 feet. By Desert Storm, the ratio of aircraft per target “flipped” to targets per aircraft, with a single F-117 being able to bomb two separate targets, with a CEP of 10 feet for each target. In the air war over Serbia in 1999, a single B-2 could attack 16 separate targets, each with a CEP of 20 feet.<sup>135</sup> Increases in the range of weapons (or standoff range in the case of aircraft-delivered ordnance) mean that the depth of the potential battle area has increased. However, these two factors also combine to mean that requirements for pilot “hot stick”

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<sup>135</sup> Brigadier General David A. Deptula, Effects-Based Operations: Change in the Nature of War (Arlington VA: Aerospace Education Foundation (Air Force Association), 2001) 8.

flying decrease while pilot survival rates increase since less pilots (because fewer aircraft are required) are exposed to fewer threats (because of increased stand-off ranges). Furthermore, since surface-to-surface missiles are also increasing in range and precision, there is a growing jurisdictional dispute as, for example, Navy Tomahawk Land Attack Missiles (TLAMs) and aircraft, as well as Army Tactical Missile System (ATACMS) and artillery provide overlapping capabilities to attack some targets. In the opening hours of Desert Storm, TLAMs, conventional air-launched cruise missiles, stealth fighters, fighters, and helicopters were all used to attack targets.

If there is no requirement for pilots or weapons system operators to visually acquire and identify targets through the canopy, the aircraft only serve to bring the weapons close enough to be within firing range. Then the issue becomes one of whether it is more efficient to have flying warehouses of air-to-surface missiles or to fire them individually from the surface. At the extreme end of the weapons progression, the ICBM and its shorter-range cousins could replace the manned bomber and fighter-bomber, and SAMs the manned fighter-interceptor. In the middle lie solutions like Unmanned Combat Aerial Vehicles (UCAVs), which provide long loiter times over targets, and which could serve as fighters, actually engaging targets, or flying warehouses—all with “pilots” safely on the ground “flying” the UCAVs via joysticks or computer keyboards. At the near end, heroic and visionary warriors continue to fly aircraft, use as many launch and leave weapons as possible, and watch as combat decision-making continues to migrate out of the cockpit and into the C4ISR system.



Consequently, the next chapter examines the impact of technology and the evolution of the C4ISR system.

## **Chapter 6: Technology and the Rise of an Air Force Jurisdiction for Command & Control**

### Introduction

Technology is a multi-faceted issue with respect to the expertise and jurisdictions of the Air Force officer corps. It is more than just cruise missiles, ICBMs, and unmanned aerial vehicles providing alternatives to manned combat aircraft, or the ability to transfer some reconnaissance, communications and navigational systems into space. It is more than safer and more capable aircraft or more accurate weapons. Technology has also spawned the need to create evermore complex intelligence and command and control systems to maximize the potential of new targeting ideas and systems. Technology has also merged these systems together and shortened the decision-making cycle. Intelligence might have once said, "We think that Hitler might be in Berchtesgaden on Wednesday." The command and control system would plan a raid and generate the tasking orders. The selected bomber units, with fighter escorts, would fly to Berchtesgaden and bomb the side of the mountain. A few days later it would be clear that Hitler was still alive. Today, intelligence might say, "Look at the Predator feed. The guy getting into the white SUV is the guy we want. Shall we take him out?" If the commander says, "yes," the Predator "pilot" might launch a Hellfire missile, or keep the SUV under surveillance while another aircraft, missile or even sniper shoots the target. What is still called the command and control system has become the C4ISR system. This is what ties it all together for the Air Force and makes

operations both possible and successful. It is the Air Force officer corps' expertise in search of a jurisdiction. This chapter follows upon the heels of the discussion of the interface between technology, aircraft, weapons and Air Force officer corps expertise and jurisdictions because these factors are closely entwined with the evolution of the C4ISR system.

The impact of new technology, when viewed through the development of what Air Force officers call the command and control system, particularly highlights the chasm between the heroic warrior and the visionary archetypes. The heroic warrior archetype is well-portrayed in Builder's description of Tactical Air Command's (TAC) ideal image of war:

The ideal model of TAC's war is probably that last year over Europe in World War II when American tactical aviation—fighters and fighter-bombers—ran “guns free” over France and Germany, shooting up everything that moved—in the air, on rails or on the roads—or that opposed them, such as the flak towers. Then the independence of air power went right down to the pilot and his freedom of flight: With a full load of ordnance and a general area of operations, he was on his own.<sup>136</sup>

The fighters were flying over enemy-held territory, out of communications contact with their units. Nobody knew exactly what they were doing or did until they landed or until they were within radio range. On any particular day, the pilots might be effective in discovering important troop movements or destroying things on the ground or in the air. Pilots might not stumble upon any targets, or they might miss valuable targets because they saw less important targets first and expended their ordnance on them. There was

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<sup>136</sup> Builder, Masks, 137.



also no easy way to assess the damage inflicted on a target, no easy way to tell other aircraft about the target and its location, and whether someone else should also attack it too, until approaching the airfield for landing. Furthermore, a pilot flying alone might experience engine problems and make a forced landing, or even get shot down, in which case his observations might never be passed on. In the modern world, this whole approach to war would be regarded as inefficient, and potentially ineffective. That is because communications, command and control, and intelligence technology, or better said, C4ISR, has advanced to a state where the expectation is much higher. The World War II tactical fighter scenario is almost anarchic.

The early proponents of air power were quick to call for its independence, but they meant independence from direct subordination to ground units and the piecemealing of aircraft out to various ground unit commanders. The independent air force was not about each pilot or squadron doing its own thing. In fact, it was quite to the contrary. The driving idea behind the independent air force movement was the promise that centralized control over aircraft would be able to quickly mass air forces at critical points and times in battle, as was done, for example, to support ground forces in the attacks on the German St. Mihiel salient in the waning days of World War I. Whether in the pursuit of strategic bombing objectives, achieving air superiority, tactical support to ground forces, or defense of one's own airspace, centralized control over all air assets would permit the commander to mass aerial firepower and selectively apply it where

desired or needed. The initiative would always rest with the commander who centrally controlled all of his side's air assets.

Consequently, a major fundament of the independent air force was its ability to centralize command over its assets at meaningful levels. However, this concept was not based on the idea that all the independent air force's assets in a theater would be parked at one airfield, presenting a massive target for enemy forces. Instead, the concept called for aircraft to be parked at a variety of airfields, but still be centrally commanded. If large numbers of friendly aircraft were attacking in the center, but enemy bombers attacked in the south, fighters from the north had to be able to come and assist in the south. The concept was straightforward and it was dependent on communications technology to implement. More important, it also required a different way of thinking about command than the standard military hierarchical pyramid. In practice it was dramatically different from the Army's, and perhaps even the Navy's task force, experience. For example, General Creighton Abrams, Army Chief of Staff in the mid-1970s and a former COMUSMACV (Commander US Military Advisory Command Vietnam) described the Air Force's command and control system in Vietnam in awe-inspired tones:

I'm talking about sheer power in terms of tonnage, bombs on target, and that sort of thing, and rockets, because high performance fixed-wing aircraft carry a much greater payload. And you can focus that very quickly.... I don't mean from the first brigade to the second brigade. I'm talking about going anywhere, instead of putting it in MR-4, you go to MR-1. [US military designations used for geographic areas in Vietnam. The distance between MR-4 and MR-1 is roughly 150 to 225 miles.] You switch the whole faucet, and you do it in about

45 minutes. *The whole control system and base system that supports that, there is nothing in the Army like it. There is nothing anywhere in the world like it.*<sup>137</sup>

This chapter looks at definitions of command, and command and control and Air Force concepts of command being different than more traditional military command structures. It also looks at the role of the command and control system. As a concept, the command and control system, or C4ISR, is the embodiment of von Clausewitz' *military genius*, which, when coupled with visionary forms of warfare, becomes an expertise in search of a jurisdiction. As a technology, however, C4ISR is an essential tool through which commanders exercise *military genius*. This chapter also includes a historical review of the evolution of this system. This includes a high-level view of command and control in World War II and Korea, a more detailed look at the Cold War SAGE/F-106 strategic air defense environment, and concludes with the command and control of tactical fighter operations. This review highlights the impact of technology as well as the differences between the heroic and visionary warrior archetypes. In addition, it also reveals some differences in command between the Air Force officer corps and those of the other services. Finally, as with the development of weapons technology, the ever increasing intrusion of the command and control system into flying operations, at a minimum, raises the issue of whether flying skills can over the long run continue to dominate discussions of command, leadership and expertise. But first, some definitions are in order.

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<sup>137</sup> Gen Abrams was speaking at a hearing before the Committee on Armed Services, House of Representatives, 93<sup>rd</sup> Congress; quoted in Momyer, 274-275. (*Italics added*).



### Definitions of Command, Control, and Command & Control (C2)

In the traditional ground forces' and naval concepts of *command*, the commander is in charge of a unit or ship, both the personnel and equipment. The commander is responsible for what the unit or ship do, and he leads his unit or ship to achieve its assigned tasks in combat and peacetime. He is responsible for operational or combat leadership as well as administrative management of the unit or ship. That unit or ship fits into a pyramid-style structure with several echelons of command, with each level amalgamating lower level units under its command. Several squads form a platoon; multiple platoons form a company, and so forth. Orders come down the pyramid from higher echelons to lower ones. At each node the orders are translated into information and orders for that node's subordinate units. Information generally flows upward the same way, being consolidated at each node. Officers progress similarly upward, starting normally at the bottom, and rising up through the levels, with periodic jumps to staffs at higher levels, followed by returns to command along the progression. In this way, they gain an appreciation for the pyramid, as well as their current place and role in the pyramid. The higher the echelon, the bigger the commander's supporting staff. There is also a baseline unit, below which no further division is traditional, practical or possible. Baseline or higher units can be broken off at the command nodes and assigned to other commanders, but the baseline unit remains the same in terms of personnel, equipment, and internal chain of command. It simply has a new chain of

command at the higher levels.<sup>138</sup> The pyramid's primary direction for information flow in the traditional ground and naval forces model is vertical. After all, that would seem to be what traditional military command is all about: A clear-cut subordination of many to one. Each soldier or sailor can theoretically find his place in the pyramid and draw a line up the chain of command to the Commander-in-Chief, the President of the United States, as well as down through whatever subordinates he or she has.

From the Joint Staff's perspective, *Command* entails three relationships. The first is the planning, organizing and directing of one's own subordinate forces as well as looking out for their health, welfare and morale while maintaining discipline. The second is coordinating with other equivalent commanders. The third is controlling forces that are largely, but not completely subordinate to the commander.<sup>139</sup> *Control* is the "authority that may be less than full command exercised by a commander over part of the activities of subordinate or other organizations."<sup>140</sup> *Control* currently exists in two variations: Operational control and tactical control. Operational control occurs

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<sup>138</sup> In the Navy, the basic fighting unit is traditionally the ship. The ship is both home and a mobile fortress. It is subdivided into different departments, responsible for particular aspects of the ship. Officers begin their careers in these departments, moving up to department heads, with intermittent staff duties, and eventually become skippers of ships. Ships can be joined together into task forces or battle groups with ensuing staffs, forming a bigger pyramid of command, but the ship with its internal pyramid remains the basic unit.

<sup>139</sup> The Joint Staff defines command as follows: "*Command*: The authority that a commander in the Armed Forces lawfully exercises over subordinates by virtue of rank or assignment. Command includes the authority and responsibility for effectively using available resources and for planning the employment of, organizing, directing, coordinating, and controlling military forces for the accomplishment of assigned missions. It also includes responsibility for health, welfare, morale, and discipline of assigned personnel." See Department of Defense, *Dictionary of Military and Associated Terms*, Joint Publication 1-02, 12 April 2001, p. 79.

<sup>140</sup> Joint Pub 1-02, p. 95.



when a combatant commander transfers his command authority over a particular unit or force to a lower level commander. Operational control over a particular unit means that a commander can train, plan and use that particular unit, and even integrate it into a bigger force, but he cannot divide or reorganize the unit's subunits, or interfere with the unit's internal organization, administration, logistics, training and discipline.<sup>141</sup>

Tactical control over a unit or force is further limited, but like operational control, can be delegated from the combatant commander on down. That is, a commander could have full command over some forces, operational control over others, and tactical control over a third set. For a unit placed under his tactical control, the commander's authority is generally limited to planning and ordering the unit to perform specific tasks and to execute maneuvers in the battle area or operational area. Someone else still has operational or command authority over that unit.<sup>142</sup>

These distinctions are perhaps more critical to the Air Force than to the other services because, in comparison to the more traditional ships and ground units, aircraft, satellites and missiles can more quickly provide a presence at immense distances, often over hostile territory. However, that presence is fleeting. Whereas it can take weeks to

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<sup>141</sup> Operational command gives the commander "authoritative direction over all aspects of military operations and joint training necessary to accomplish missions assigned to the command." It also "normally provides full authority to organize commands and forces and to employ those forces as the commander in operational control considers necessary to accomplish assigned missions." However, "operational control, does not, in and of itself, include authoritative direction for logistics or matters of administration, discipline, internal organization, or unit training." See Joint Pub 1-02, p. 310.

<sup>142</sup> Tactical control is "command authority over assigned or attached forces or commands, or military capability or forces made available for tasking, that is limited to the detailed, and usually, local direction and control of movements or maneuvers necessary to accomplish missions or tasks assigned." See Joint Pub 1-02, p. 419.



move a heavy Army division and its equipment from Germany to the Middle East, a bomber might fly a mission from the US, dropping bombs in the Middle East today, but be back in the US serving as part of the nuclear triad the day after tomorrow.

Furthermore, the Air Force has long lost any correlation between combat formations and administrative units like squadrons, groups and wings. A squadron, group or wing commander still plans, organizes, directs and trains his unit, and the commander still has responsibility for the health, welfare, morale, and discipline of the personnel, but the commander does not lead his entire unit into battle anymore. The modern air tasking order assigns missions to single aircraft, and two- or four-ship formations that the squadron must provide, but the squadron as a whole does not fly as such. As weapons and the command and control system improve, fewer aircraft are required to provide more air-to-ground and air-to-air capabilities than in previous wars—but more *types* of aircraft are required.

In Vietnam and afterwards, even with air superiority, fighter-bombers typically cannot simply fly in to a target alone, bomb it and go home. Instead, a raid package consisting of several small groups of different types of aircraft from different squadrons and even different bases is used to counter the variety of threats aligned against friendly aircraft. The raid package is built around air-to-ground fighters, whose bombing mission forms the whole point of the raid. The raid package might also contain, for example, some air-to-air fighters to protect the raid package from enemy fighters, electronic warfare aircraft that physically attack radars and surface-to-air missile sites,

and reconnaissance aircraft. The air tasking order typically also assigns one aircraft to act as the raid package commander.<sup>143</sup> Furthermore, air-to-air refueling tankers may provide the raid package aircraft fuel before or after the strike, electronic warfare aircraft may jam enemy surveillance and control radars during the strike, intelligence-gathering aircraft may be monitoring enemy communications during the raid, command and control aircraft probably oversee the entire operation, and satellites might provide additional pre- and post-strike reconnaissance. A theater air commander might have full command over some provisional wings made up of fighter and attack aircraft, operational control over some of the command and control aircraft, and only tactical control over bombers coming in from outside the theater for a few hours. The theater air commander controls them all in combat and operations primarily through the *command and control system*.

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<sup>143</sup> This person, usually a pilot, has no official authority on the ground, but he coordinates some level of mission planning among the participating units, by secure phones if the aircraft in the raid package are based at different bases. In the air, his primary responsibility is the decision to cancel the raid or to shift the attack to the secondary target set. If for example, the supporting electronic warfare aircraft do not arrive, that may be a reason to cancel, or if weather obscures the primary target set, he may shift the raid to the secondary set. He has no more information, and not necessarily any more experience or rank, than the other pilots in the raid package, but assigning this responsibility to one person reduces the uncertainty and chaos when beyond radio range of the command and control system. Since the aircraft are coming from different units, and perhaps bases, and rank has no meaning in the air, somebody has to be given the responsibility. If the duty was not assigned to one person, raid packages might plow ahead on suicide missions, or the raid packages might breakdown. Different members of a particular raid package might make independent decisions to abort or press on to the target, or the various pilots might try to reach a consensus decision. The first case (suicide) is the most likely, but none of these three outcomes are positive.



Consequently, two more definitions are in order. The first is *command and control*, which the Joint Staff defines as:

The exercise of authority and direction by a properly designated commander over assigned and attached forces in the accomplishment of the mission. Command and control functions are performed through an arrangement of personnel, equipment, communications, facilities, and procedures employed by a commander in planning, directing, coordinating, and controlling forces and operations in the accomplishment of the mission. Also called C2.<sup>144</sup>

The second definition, which is very similar, pertains to the *command and control system*, which refers to “the facilities, equipment, communications, procedures, and personnel essential to a commander for planning, directing, and controlling operations of assigned forces pursuant to the missions assigned.”<sup>145</sup> Part of the command and control system is primarily concerned with planning and issuing daily air tasking orders to all units participating in the operation, and part of the command and control system primarily controls the on-going operation, modifying the plan as necessary as new information becomes available or when things go awry. For example, if a tanker, scheduled to refuel a combat air patrol screening command and control aircraft orbits, has engine problems, a new tanker must be found, another extended or retasked, the next set of fighters for the air patrol must take off earlier, or there will be a temporal gap in the fighter screen.

Because airpower is so wide-ranging and fleeting, *the command and control system* is not at all like the traditional ground forces divisional or corps-level staff or a

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<sup>144</sup> Joint Pub 1-02, p. 80.

<sup>145</sup> Joint Pub 1-02, p. 80.



naval battle group's staff. First of all, the system is widely distributed in terms of geography. Although there usually is a centralized staff somewhere to develop plans, issue air tasking orders, and nominally control on-going operations, the direction and controlling of operations requires the communications, radar, intelligence and other facilities and personnel, who are spread throughout a variety of sites. Satellite controllers of communications and reconnaissance satellites might be located in the continental United States. A mobile ground-based air surveillance and control radar post might be set up in friendly territory close to the battle area, E-3 Airborne Warning and Control System (AWACS) aircraft and other surveillance and reconnaissance aircraft could be basing out of airfields in adjoining countries or even flying in from out of theater. Furthermore, the centralized staff or headquarters need not be geographically close to the battle zone. Planning and daily air tasking orders for operations in Afghanistan are done in the Combined Air Operations Center (CAOC) in Qatar. The air commander does not beef up a fighter wing's staff like an Army commander might do with a corps staff to plan the campaign, and there is no airborne flagship replete with battle staff in the middle of a tactical air operation. In fact, the air commander's command and control system need not have any particular ties to any of the forces under its control. They are all viewed as interchangeable parts. Although some area experience may be beneficial, bombers bomb, fighters fight, and command and control system personnel generally provide control over on-going operations. In theory, all can easily be rotated in and out of a theater. In addition, the command and

control system is essentially a separate chain of command, providing the planning, operational direction, and control over the actual aircraft and pilots while they are flying the missions. These pilots, however, report up administrative chains of command to whomever has operational control or full command over them. These chains may intersect at the (joint forces) air component commander, or they may not. During the Vietnam War, for example, SAC never relinquished command or any real degree of control over its bombers flying bombing missions over Southeast Asia.

Command over air operations has evolved over time, and the tendency is one of increasingly centralized command and control over not just the planning, but also over the pilots as they fly the missions. The heroic warrior archetype naturally is not receptive to this shift. The heroic warrior sees the pilot and the manned aircraft as the crux of airpower. The pilot is the ultimate decision-maker, the final man in the loop, the one who takes a bad plan and, through flying skill and ingenuity, makes the mission a success. He is the one there in the midst of battle, dodging flak and enemy fighters. He knows what needs to be done and what can be done, and in the best von Clausewitzian tradition, instantly assesses the situation, makes his decision, and stands by it. His view is summed up by the phrase “centralized planning, but decentralized execution.” Yes, it is important in the independent Air Force that airmen have the ability to centrally control all aircraft so that maximum effort can be applied to the various target sets. Airpower is ineffective if it loses its independence and all aircraft are simply piecemealed out in support of ground units. Airpower is also ineffective if it

is piecemealed out in disconnected independent air operations. Consequently, air headquarters should make the air plan, but leave it to the pilots flying the missions to actually implement the plan. Unexpected things always come up and flexibility is the key to airpower. And that flexibility rests on pilot initiative.

However, from the visionary point of view, improvements in technology make more information available for centralized decision-making during combat operations. Furthermore, technology also makes it possible to make potentially more effective and efficient decisions outside of the cockpit, as for example by air battle managers or by forward air controller-types on the ground or in the air directing close air support strikes. Furthermore, as unmanned combat aerial vehicles become a reality, the ultimate decision-maker, the final man in the loop, the one who takes a bad plan and, through flying skill and ingenuity, makes the mission a success—need not be pulling 9-Gs in an aircraft on the scene. It can be someone sitting at a console in an aircraft or on the ground controlling a part of the battle for the commander. And if the situation warrants, it could even be the commander himself.

#### Overview of C4ISR Evolution, World War I through Korea

As aircraft as well as command and control system technologies evolved, conceptions of command and control became specialized, matching the missions performed. Strategic bombing, for example, was designed to fly deep into the enemy's



heartland, far beyond practical communication or radar range.<sup>146</sup> Planning and procedures became critical means of control. Strategic air defense, on the other hand, could be flown entirely under radio and radar coverage, allowing the deepest penetration of ground-based decision-making and control over aerial operations. Tactical missions fell in the middle. Missions might be flown under friendly radar and radio coverage, and close air support missions required close coordination with the ground units being supported. In any event, tactical aircraft required some degree of control and coordination, if for nothing else than to prevent friendly ground forces from firing at friendly fighters flying air defense over top of them or at friendly fighters returning from deep interdiction missions. However, as the technologies continue to evolve, there has been a reversal of the trend towards differentiation. There has been a blurring between what was once called strategic bombing and tactical operations, with big bombers bombing tactical targets (e.g., enemy ground forces) in Vietnam, Desert Storm, the Balkans, Afghanistan and Iraq, and tactical fighters flying deep into the enemy's heartland to attack strategic targets (e.g., electrical grids and leadership targets). In addition, short of nuclear options, command and control systems have also blurred, with a similar structure being used for all operations.

In World War I, the chain of command over pilots and aircraft was essentially the same for both administrative and operational duties. Command and control over the

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<sup>146</sup> Although bombers from WWII on were equipped with High Frequency (HF or shortwave) radios, which provide theoretical global communications, HF frequencies are affected by atmospheric conditions and very noisy. Consequently, they were not used for extensive decision-making discussions.

aircraft was accomplished via the overall plan as translated into air tasking orders provided to the flying units, established procedures, and any other late details passed to the pilots before they took off. Without radios, the airplanes were on their own once they took off. Pilots were limited to hand and aircraft signals, and air commanders on the ground at all levels were isolated, in an information void until the aircraft returned. Pilots would report their results after landing, and if they had to land at another base, they might be able to update their status from there. The plan and the tasking orders were the concerns of air headquarters, but the missions themselves were left to the pilots. This was “centralized command, but decentralized execution.”

Plans and procedures provide a degree of control over subordinates, but a real-time communications system provided a big boost in the control of air forces. By World War II, radio signals were being used for navigational aids and communications. Radios were standard equipment in airplanes, although frequency selection was limited. Headquarters would develop the plan and send out air tasking orders with details for targets, timings, etc. Depending on the mission, squadrons, and even groups, wings or higher levels of command might fly together in formations under the command of the unit's senior officer. The radios allowed some degree of coordination and the ability to do minor modifications in the air. The plan and ensuing orders set the participating units and their respective targets and/or missions, as well as the overall timings and routes. The big bombing raids were massive undertakings, and there was no tolerance for individual pilot independence. There was centralized command, but no

decentralized execution in mass bomber raids. Over enemy territory, the bombers tried to stay in tight formations for self-protection and to achieve closer bomb patterns. Pathfinders or else the unit's lead aircraft would get the formation to the target and call the bomb drop. A regular bomber pilot's room for decision making was constrained to deciding whether to abort the mission if the aircraft encountered technical problems or was shot up. Commanders of escort fighters had some flexibility in determining how to best escort their charges and when and how to go after enemy fighters, and once an attack started, pilots had leeway in how to fight their particular part of the *mêlée*. Although commanders led their units in battle, opportunities to manage an organization doing violence were minimal. The fighter-bombers that Builder described worked under the concept of centralized command, decentralized execution, but they were not flying in large unit-sized groups.

Airborne radios permitted commanders on the ground to follow some operations and have a sense of what was going on. The commander on the ground's access to information was limited by the aircraft radios' power, frequency, range, and altitude. A commander on the ground might even issue directives or at least concur in changes such as switching to the secondary targets because of weather over the primary. Aircraft in a flight or raid could communicate with each other and perhaps with commanders on the ground. Commanders on the ground could also get more immediate feedback on the success of the mission. This was the standard for World War II missions, which were generally flown beyond friendly radar and often radio (in the case of fighters) coverage



with commanders on the ground. Headquarters still was responsible for central planning and the development and distribution of air tasking orders assigning missions. The pilots, squadron commanders and higher-level operational commanders aboard aircraft were primarily responsible for completing the missions, but there was now some room for information sharing and the potential for commander intervention from the ground.

Strategic bombing operations have not evolved dramatically from this point. The command and control system for conducting a strategic, nuclear war has always been very heavily weighted towards the planning side, with very limited capabilities to control aircraft or other systems once launched. The Single Integrated Operations Plan (SIOP) determines the options and the corresponding target information. The SIOP is vigorously choreographed. There is no room for missiliers, bombardiers, or pilots to ad lib on targets or routes. Each missile, aircraft and bomb is part of a comprehensive plan, with, for example, certain missiles destroying enemy air defenses that would threaten specific bombers on their ingress to their targets. Deviating from the plan could have serious consequences, including high risks of fratricide and leaving important targets out of the attack. Once fired, there is no way to “recall” ICBMs, SLBMs, or cruise missiles. At best, they might be destroyed, disarmed, or diverted, but then only up to a certain point of travel. Even bombers eventually reach a practical point of no recall. Consequently, the emphasis has been on the plan, and a thorough understanding of the implications of a decision to implement it. The Air Tasking Order

for missions in tactical or conventional warfare has evolved in the direction of the SIOP and become increasingly complex. Although missions become evermore interdependent, routes and packages must be deconflicted to minimize fratricide and interference.

Radar was the next ingredient added to the command and control system. Radar made its debut in aerial warfare during the Battle of Britain in World War II. During the war, both sides improved radar technology, learned to conduct electronic intelligence gathering, and developed rudimentary countermeasures. However, ground-based radars are limited in coverage by the curvature of the earth. The further away a target is from the ground-based radar, the higher it must be in order to be seen. In addition, the radar's power, sensitivity, and sweep-rate affect its range. Since radars were not typically placed right at the border or the forward edge of the battle area and airborne surveillance radars were not a reality until after the Korean War, radar coverage was typically limited, with the best coverage over one's own territory. Therefore, ground-based radars were primarily seen as a key part of air defense, with limited practical application for offensive missions. On offensive missions over enemy territory, targets, whether in the air or on the ground, had to be acquired visually. Planes could fly faster and higher than previously, but the pilot's or crewmembers' eyes still provided the most situational awareness. In addition, bomb sighting was done visually, and the effective range of the onboard guns was within visual range.

On the air defense side, however, the combination of radio, radar, and signals exploitation technologies led to a new development—the ability for people on the ground to actually control aircraft in flight and direct them in accomplishing their mission. The command and control system jumped beyond control via planning and procedures. The British and the German air forces gained the most experience with the strategic air defense systems in the war. In essence, radar, ground observer reports, intercepted communications and common sense were blended together to provide a picture of an impending raid, its direction, likely targets, altitude, size, etc. As the raid approached, the ground-based radars would continue to track it, providing real-time updates on the raid's heading and altitude (which was not as accurate) as well as information to calculate or to make informed guesses as to its speed, size and targets. The air defense center would scramble the appropriate number of fighter units available near the anticipated bomber raid's flight path, provide warning to potential targets, alert antiaircraft artillery units and deconflict their fire from the fighter-interceptors. Once airborne, the fighters would be directed by an intercept controller on the ground to fly a prescribed path at a prescribed altitude that was calculated to bring the fighters to a position from which they could see and attack the incoming bombers. Once the fighter leader saw the bombers, he would take over the intercept, engage the bombers with his unit, and return to base. The fighters and intercept controller were on the same frequency; the intercept controller heard details of the fight and received reporting as the planes returned to base.



Although the intelligence from *Ultra* decrypts, radio intercepts and ground observer reports could have been correlated and plotted in the absence of radar, the information would not have been as accurate or up-to-date. Knowing that the Germans planned a raid to bomb the dockyards in London at 10:00PM, and intercepting radio chatter as the planes formed up across the Channel, would not be enough to tell exactly where the bomber raid was at any given time. Furthermore, they might have a slight delay or be a bit early over the target, and clouds might force them to a higher or lower altitude than planned. In addition, they might make a navigational error or fall prey to British electronic warfare tricks and simply bomb the wrong place. Ground observers were not particularly accurate and there was an inherent delay in gathering and consolidating their reports. Consequently, without radar, the defensive fighters could not wait at their airfields, saving gasoline, to be scrambled when the bombers were in intercept range and the bombers' course and altitude were relatively clear. If there were no radar, the RAF would have had to rotate squadrons through combat air patrols over the shipyards along the Thames, hoping to have the maximum number of fighters with relatively full fuel tanks airborne in the area and at the right altitude when the bombers arrived. The fighters would patrol, searching every direction and potential altitude in the dark until they discovered the bombers, hopefully before they began bombing. Radar, however, gave steady and accurate updates of the raid's location. The radar updates, combined with the other intelligence made it possible to accurately track the bombers' locations. In addition, the RAF's Identification Friend or Foe (IFF) feature

distinguished British aircraft from enemy aircraft. Consequently, the commanders and intercept controllers on the ground could confidently decide when to scramble whom, and direct them throughout the intercept until the fighters visually acquired the targets. In addition, the information on the German bombers could also be passed to searchlight and antiaircraft artillery units to engage the bombers where and when British fighters were not operating. Finally, while under control, the fighters could be directed back to base, deconflicted from other fighter units coming to join the fray with the bombers, and need not fear friendly anti-aircraft artillery. This was the epitome of a centralized, effective and efficient air defense *system*. The Germans developed a similar air defense system, although they had to protect a much larger area and lacked the very significant capability of being able to decrypt Allied air tasking orders.

Radar systems improved during the course of the war; by its end, night fighters with airborne intercept radars were in use. The air defense system illustrated several important results of technology on potential air force officer expertise. First of all, it was not only possible, but necessary, for an intercept controller on the ground to direct the fighters to the target. Flying around aimlessly looking for bombers was a waste of fuel and had a low probability of success. If one did not know exactly where the bombers were, where they were going and at what altitude, they were hard to find. In addition, even if the bombers were seen, they might be at an altitude and distance that precluded an attack. The public below had a keen interest in seeing that the fighters intercepted and engaged the bombers. Civilian lives depended on it; so it became a

public review of sorts of the air force's officer corps' jurisdiction. Was the air force officer corps upholding its end of the contract and effectively defending the country? In the RAF's case, the fighters and the then-largely secret ground-based air defense system earned their nation's eternal tribute.

A second major change, at least in the solo flying night fighters, was that there was no real difference during flying operations as to whether the pilot was a unit commander or rank and file pilot. To the intercept controller, a night fighter was just a night fighter, regardless of who was piloting it. Command on the ground had obvious ramifications in terms of unit manning, equipment, training and morale, but it was immaterial in the air. There was a split: On the ground, the flying unit's commander had responsibilities that stopped when one or more of his aircraft took off. Once airborne, a voice on the radio belonging to someone that the pilot probably had never met was in charge, directing the pilot's actions. Furthermore, this voice did not necessarily belong to an officer with pilot training (and historically this voice is not always that of an officer). This is not to say that the pilot's role was now devoid of responsibility and decision-making. At some point, the pilot still took over the intercept, determined his tactics and engaged the enemy aircraft. However, a big piece of Huntington's management of a human organization conducting violence moved from the cockpit to the intercept controller on the ground. And although that intercept controller was in a chain of command that passed through sector amalgamations to some point where it tied to the same commander somewhere high up in the fighter



pilot's chain of command, the intercept controller was not simply a member of the commander's staff, giving advice or making plans. The intercept controller was essentially commanding, or at least in tactical control over, the aircraft assigned to him. The intercept controller was the bottom link in the *command and control* chain and simultaneously, for a brief period of time, the top link in the tactical operations chain. However, when the pilot landed, he reverted to his squadron chain of command for administrative, training, morale and discipline purposes. The air defense model is noteworthy not only because the differentiation between the administrative command on the ground and the command and control in combat functions, but also because different types of personnel with different training were used for each position.

In addition, as is often the case in flying operations, functional positions, not ranks, are important. The intercept controller could be a lieutenant, perhaps even a sergeant, and the aircraft under control could be a single night-fighter flown by a lieutenant or lieutenant colonel, or a fighter wing led by the wing commander. In either case, the intercept controller was still responsible to direct the aircraft into a position where the fighter aircraft could take over the intercept and engage the enemy aircraft.<sup>147</sup>

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<sup>147</sup> In a similar vein, in a multi-crewmember aircraft, it is often the case that the aircraft commander, a pilot, is junior in rank to other officers on the crew, but nevertheless still is the commander over all onboard during flight operations. In multi-ship operations, it is also possible that a wingman is senior in rank to the flight lead, but once again, the position, not the rank determines who is in charge. Rank becomes meaningless in the air, which then has certain repercussions on the ground, which will be discussed in later chapters covering corporateness.

### Strategic Air Defense: SAGE and the F-106

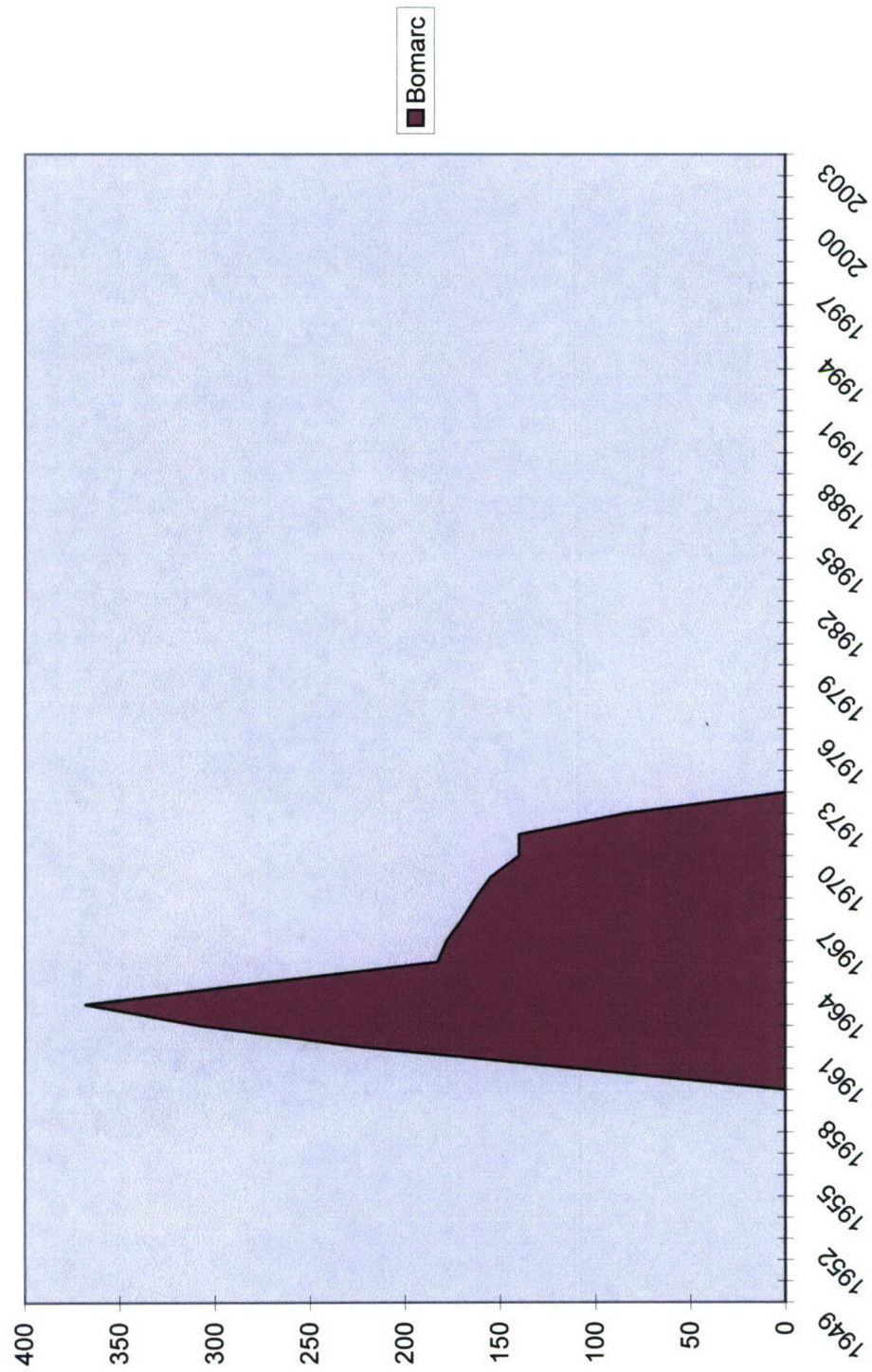
In the early days of the independent Air Force, the heroic warrior archetype may have been able to downplay the RAF's experience in the Battle of Britain as a peculiarly British event. After all, the Germans could not stop the strategic bombing campaign against them, at least not after drop tanks made it possible for the escort fighters to cover bombers for the duration of their ingress and egress routes. In the Pacific, the strategic bombing campaign was also a success, partly because it did not start until the Navy's submarine campaign effectively cut Japan off from its sources of gasoline and other natural resources. With those minor caveats, the pre-war theories of independent airpower were proven. The Air Force gained independence, and gleaming bombers carrying atomic bombs would be unstoppable. Or would they? The Soviet Union's development of a B-29 look-alike and the atomic bomb gave cause for public reflection—Air Force bombers may be unstoppable, but Soviet bombers had better be stoppable. Heroic warriors or not, the Air Force officer corps had both a public and legal jurisdiction for the air defense of the United States.

The Air Force began a massive build-up of air defenses to meet its responsibility. For example, in 1948, Strategic Air Command (SAC) had 340 fighters to escort its bombers. At the same time Tactical Air Command (TAC) had 331 fighters, and Air Defense Command (ADC) had a paltry 166 fighters. By 1956, SAC still had 375 fighters in 15 squadrons, TAC had 582 fighters in 35 squadrons, but ADC's fighter

strength rose to 1937 fighters in 68 squadrons. Of course, fighters were only a small part of the equation. The Air Force also introduced another anathema for the heroic warrior—the surface-to-air missile (SAM). Adding insult to injury was the short-lived designation of Air Force SAMS as unmanned fighters, which they essentially were. The Bomarc had a range of several hundred miles. Of course, as with the unmanned bombers, the designation unmanned fighter also carried the association that this expertise lay within the Air Force officer corps' jurisdiction. Chart 6-1 (Number of Surface-to-Air-Missiles by Type and Year) shows that the Air Force possessed 110 Bomarc SAMs in FY1960. The number of Air Force Bomarcs peaked in FY1963 at 368, but they remained in operational service through FY1972. Command and control was the key to the strategic air defense system. The number of officers who were intercept controllers (also known as weapons controllers/directors and later air battle managers) rose from 231 in 1950 to 3921 in 1963. The US and Canada joined together in the North American Air Defense Command (NORAD), which for the first time placed both Canadian and US military units under a joint commander in peacetime. NORAD began operations in 1957, the same year the Distant Early Warning (DEW)



**Chart 6-1: Number of Surface-to-Air-Missiles by Type and Year**



Line began operations.<sup>148</sup> The DEW Line is a string of radar stations stretching from northwest Alaska to the east coast of Greenland, which formed the outer surveillance perimeter for warning of an impending Soviet bomber attack.

The culmination of the tremendous investment in continental air defense in the 1950s was the technological marvel of its day—the SAGE air defense system with its primary weapons, the F-106 fighter-interceptor and the Bomarc unmanned interceptor (SAM). Although in some ways irrelevant before it was completely deployed because of Sputnik and its foreshadowing of the Soviet ICBM, the SAGE and F-106 system continued to be the backbone of US continental air defense into the 1980s. Developed in the early age of computers, the contemporary descriptions of SAGE stated:

The advent of the high-speed long-range all-weather bomber and missiles of various stages has made it mandatory that our present ground environment be revitalized. Men alone, do not have the capability to comprehend a complex, constantly shifting air situation and make the required decisions in the few seconds that modern high-speed aircraft and missiles allow. The successful development of the high-speed digital computer provided a machine that can perform complex mathematical problems in seconds that would ordinarily take months to solve. Scientists—quick to realize the benefits to be derived from this computer—envisioned its use in Air Defense. Thus, the Semi-Automatic Ground Environment System, commonly referred to as SAGE, was born. Although many functions are performed automatically, the system is only

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<sup>148</sup> ADC remained the organizational command of the Air Force contribution to NORAD, but it was subordinated for a time to the US joint Continental Air Defense Command (CONAD), which was formed in 1954 as the umbrella for all American services' contributions to NORAD. CONAD and its successors also provided the option for the US to act unilaterally if necessary. Eventually, since the Air Force provided the vast majority of people and systems, ADC became Aerospace Defense Command (ADCOM) and replaced CONAD as the American contribution to NORAD and a US specified command. In this capacity, Army SAM units were placed under ADCOM, which was still an Air Force Major Command, commanded by an Air Force general.



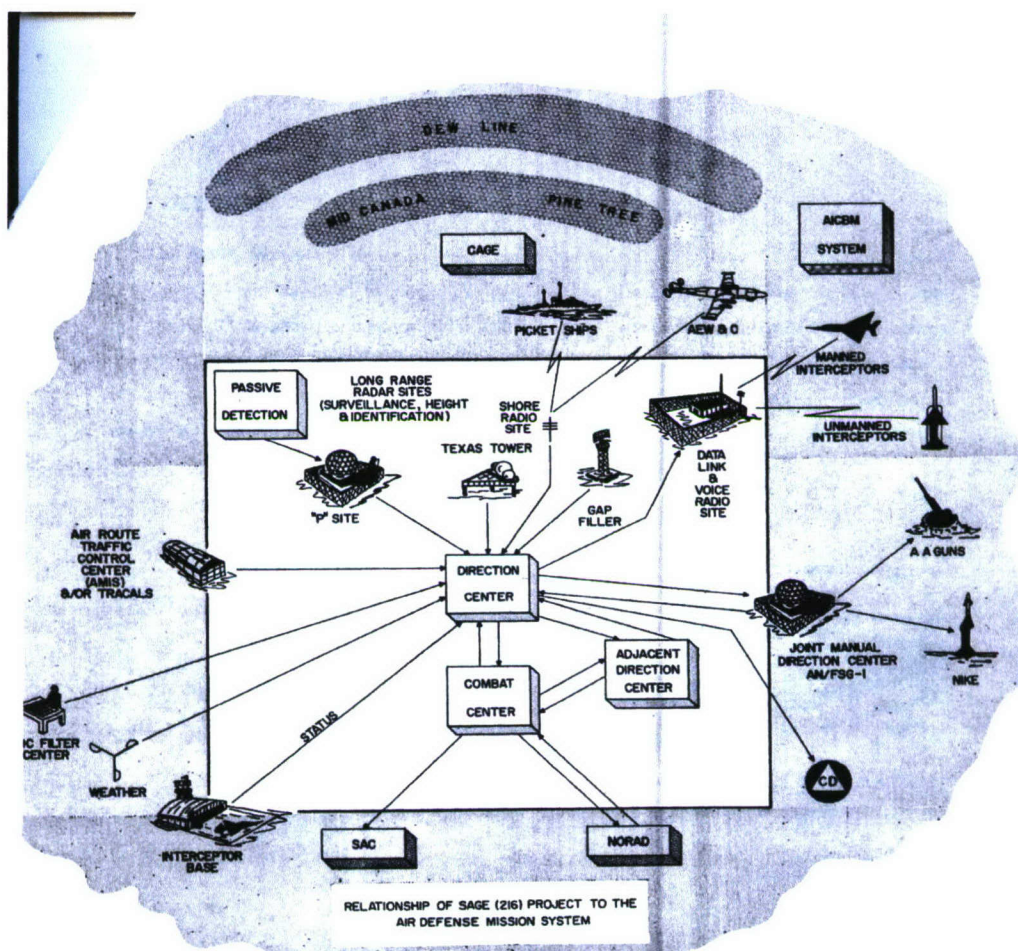
“semi-automatic” because men are still needed to make decisions. “Ground Environment” indicates that the system excludes airborne facilities.<sup>149</sup>

The decisions requiring the man-in-the-loop primarily involved whether to and how to intercept inbound aircraft. Specifically, the surveillance and identification section of the SAGE center had to decide whether an inbound aircraft met identification criteria for categorization as friendly, in which case no interception was required. If the inbound aircraft could not be adequately identified with available information, it would be classified as unknown, which might require its interception and visual identification. Finally, if an inbound aircraft met the criteria for classification as hostile, it would be intercepted, engaged, and destroyed. If an intercept was required, the intercept controller and his superiors would then be able to look over the readiness statuses of various fighter and SAM units, determine which was optimal for the particular mission, and order the fighter scrambled or the missile prepared for the engagement. In addition, the man was also in the loop to monitor the computer and to modify or override computer-generated information as needed. SAGE was “ground environment” because there was conceptually a partner “airborne element,” which eventually was embodied by the E-3 Airborne Warning and Control (AWACS) aircraft, whose software largely duplicated the SAGE system’s algorithms and capabilities. See Figure 6-2 (SAGE System).

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<sup>149</sup> Western Electric Company Inc., The SAGE Direction Center, SAGE Air Defense System, [USAF Contract No. AF 33 (600) 29307], 15 Aug 1958, 3.





### SPHERE OF INFLUENCE

In conjunction with related elements of the Air Defense System for the continental United States, SAGE is designed to detect the approach of aircraft and identify them as friendly or hostile. SAGE, through its huge IBM computer, can calculate the course and speed of enemy planes in seconds and dispatch guided missiles and interceptors to the target for destruction and return interceptors to base. In performing these tasks, SAGE must operate continuously — 24 hours a day, 7 days a week.

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Figure 6-2 SAGE System<sup>150</sup>

<sup>150</sup> Western Electric Company Inc., *The SAGE Direction Center, SAGE Air Defense System*, [USAF Contract No. AF 33 (600) 29307], 15 Aug 1958, 4.

The F-106, as well as the SAGE system itself, was on the cutting edge of technology and experienced many technical problems and delays in becoming fully operational. The F-106 was designed to be an all-weather supersonic fighter-interceptor. It first flew in 1956, and the Air Force began accepting deliveries in 1959. In 1959, the F-106 set a speed record at 1525 miles per hour. Its speed, maneuverability and range were important assets, but its critical feature was its electronic package:

The Delta Dart [F-106] is equipped with the Hughes MA-1 electronic guidance and fire control system which is designed to operate with the SAGE air defense system. Using this system F-106s may be guided by the SAGE computer to within range of the intercept target where the pilot can select and automatically or manually fire the weapons on board. Weapons can be fired only with the active participation of the pilot.

The MA-1 system can control the F-106 from soon after takeoff, through climb and cruise, to attack position. The aircraft's radar is used by the pilot to detect the target, lock onto it and signal when to fire the selected ordnance to achieve the greatest kill probability.... This system also could guide the aircraft back to its home base or alternate base, but the pilot actually lands the plane. On an intercept mission the pilot may either monitor the electronic guidance and fire control system, or he may use its data for his own decisions while he manually flies the aircraft. If the SAGE system becomes inoperative or is destroyed, the F-106 can operate by using the MA-1 airborne computer.<sup>151</sup>

The SAGE/F-106 system required the onboard pilot to take off, land, and flip switches to arm his missile and to let the on-board computer take over the firing of the missiles when the F-106 was in the launch envelope. The combination of the data-linked SAGE and the MA-1 computers could do everything else. The intercept controller on the ground could use his computer to scramble a battle-ready F-106 and

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<sup>151</sup> Secretary of the Air Force, Office of Information, Fact Sheet (79-12): F-106 Delta Dart (Washington: Secretary of the Air Force, 1979) 1.



order the F-106 computer via data-link to intercept a particular target, determine whether the intercept was for visual identification or destruction of the target, set all speeds, altitudes and headings of the F-106, determine whether the intercept was to be made head-on, from the side or from the stern, and after the intercept, order the F-106 to another intercept, to a point in space, or to return to home base or an alternate landing base. The heroic warrior in the F-106 was a few toggles away from drone status.

However, the F-106 was not a failed unmanned combat air vehicle (UCAV) of the 1950s. The F-106 was never intended to be a super SAM—that was the Bomarc's job, and its operational range was several hundred miles. The available technology and the expected scenario played major parts in the development of the SAGE/F-106 system. The worst-case scenario called for hordes of Soviet bombers to come over the North Pole with additional aircraft that could jam radars and communications. By the time that SAGE and the F-106 were operational, the Soviets were also capable of clearing out some of the SAGE system with intercontinental ballistic missiles (ICBMs) or long-range air to surface missiles. Consequently, the system was designed to have several layers of redundancies. If the NORAD command center was destroyed or out of communication, sector commanders would take over full responsibility for their sectors. If a sector command center went down, its neighboring sector command centers or its subordinate centers could take over its area of responsibility. In fact, the SAGE system was designed to be able to quickly dump its data to another facility so that it could continue operations. If an intercept control center was destroyed, down for



maintenance, or out of the communications loop, adjacent centers could take up the load. As each senior node disappeared, responsibility would continually shift downwards or sideways. Consequently, since intercept controllers would be expected to handle ever more interceptors over larger areas, automated data-linked commands would make this easier. Data-linked commands would also be less vulnerable to jamming. Fighter-interceptor radars were very limited in coverage; so they needed commands for heading, altitude and speed to find and intercept the bombers in the first place. However, if all the ground intercept control sites or data link and voice radio sites were destroyed, manned fighters and SAM operators would be the last line of defense, each doing the best it could without any external direction. The AWACS aircraft were originally developed to fill in radar, communication and intercept controller gaps, and to take over ever-larger areas of responsibility as ground sites went down.

In addition, day-to-day peacetime operations required the capability to be able to send an aircraft up to visually inspect an inbound aircraft or strange situation. An aircraft might be labeled unknown as a result of any of a number of technical problems with the flight plan system or the aircraft itself that might cause it to deviate from its flight plan or assigned identification code. Unmanned interceptors did not provide a capability, at that time at least, to transmit video footage of the aircraft, then loiter while waiting for a decision to shoot down the aircraft or to go home. In addition, the ground-based radars might miss a small aircraft flying between the fighters and the inbound

target; so the pilot provided a safety check in seeing and avoiding other aircraft in the area during an actual intercept. Finally, the F-106 (and F-101) could be equipped with an atomic air-to-air rocket, the AIR-2A Genie, which would of course be fired into the hordes of Soviet bombers *over Canadian or US territory*. The pilot and intercept controller together provided a final check on the employment of such a politically charged weapon.<sup>152</sup>

In the end, there was a certain amount of distrust of all the electronic magic and concern as to whether it would all work correctly. Consequently, the heroic warrior in the cockpit fulfilled a final man-in-the-loop sanity check. His eyes were the ultimate arbiter. If there was any question as to who or what a particular aircraft was, it was simple enough to scramble a flight and have them go and take a look. The crew's visual identification overrode all the electrons, inferences, flight plan correlations, and other methods of identification.<sup>153</sup> This man-in-the loop role is still very much in evidence

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<sup>152</sup> The Bomarc surface-to-air missile was also capable of carrying a nuclear warhead.

<sup>153</sup> From this perspective the accidental shoot-down of two Army Black Hawk helicopters over Iraq in April 1994 by a flight of two Air Force F-15s under control of a US AWACS was a particularly significant event. The Air Force aircraft were enforcing the No-Fly Zone over northern Iraq. The F-15 flight lead was a captain; his wingman was both a lieutenant colonel and the squadron commander on the ground. The F-15s detected the helicopters with their radars, but the AWACS systems only intermittently detected the helicopters. The F-15 flight advised AWACS of their contacts and ran an intercept to visually identify the unknown contacts. The F-15 flight visually identified the helicopters as Hinds and shot them down. The Air Force court-martialed the Senior Director on AWACS, a captain who was in charge of the air battle managers controlling the F-15s and all other aircraft in the area of operations, and other AWACS personnel accepted administrative punishments in lieu of courts-martial. The AWACS Senior Director was acquitted—a visual identification trumps any other type of information on unknown aircraft. The pilots, at least initially, were not punished in any way; their annual evaluations did not mention the incident and their records appeared to recommend further advancement. Although it could be argued that the Air Force indicated the dramatically increased role and responsibility of the command and control system by court-martialing the Senior Director and not the pilots, it appeared to ignore the tremendous implication that the man-in-the-loop, the final sanity check, the pilot's eye was no more



today in the post 9-11 world. In most cases, the command and control system still prefers to put a person's eyes on a deviant aircraft before making the decision on whether to down that aircraft. This quasi peacetime scenario remains a major justification for retaining the heroic warrior pilot in the cockpit.

The AWACS and the SAGE system's replacement continued to possess data-link capabilities for both between command and control centers as well as from a command and control center to fighter-interceptors. However, the Bomarc SAM was phased out without a replacement in the 1970s, and Air Force did not replace the F-106 with another aircraft designed specifically for the interceptor role. The threat that prompted the development of the SAGE/BOMARC/F-106 combined system, i.e., massive Soviet bomber raids with nuclear weapons, had long since lost its importance in comparison to the threat of a massive Soviet nuclear ICBM and SLBM strike.<sup>154</sup> As the F-106 was gradually phased out in the late 1970s and early 1980s, tactical Air Force fighters were moved into the strategic air defense mission, but they were not wired for the directive, one-way command and control center to fighter-interceptor data link.<sup>155</sup>

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infallible than the rest of the people and equipment in the command and control system. Scott A. Snook provides a very detailed and different analysis in his Friendly Fire: The Accidental Shootdown of U.S. Black Hawks over Northern Iraq (Princeton: Princeton UP, 2000/2002).

<sup>154</sup> A part of Aerospace Defense Command (ADC) had already evolved into providing warning of an inbound missile attack. In addition, as the interceptor aircraft numbers in ADC shrank, ADC became more involved in space, e.g., tracking satellites. Consequently, ADC shed its aircraft and transitioned to AF Space Command in the early 1980s.

<sup>155</sup> The Navy continued to use Link-4 as the data-link system was known and even developed a two-way capability. The Navy's continued reliance on the system stemmed in part from the fact that a naval battle group is always in an air defense mode against aircraft and air-to-surface missiles. The advent of ICBMs did not have the same diminishing effect on air defenses for naval battle groups, since it would be difficult for an attacker to continually update an ICBM's navigation and targeting system as the battle



F-4s, F-15s and F-16s could not be “flown” by intercept controllers using data-link, but their pilots were still under voice control of intercept controllers. The fighter radars could not “see” as far as the networked ground-based air defense radars or the airborne AWACS surveillance radar. The fighters still required assistance locating targets and were not left to their own devices to find and intercept targets unless there was no command and control system present.

At the same time, however, the use of modern F-16 and F-15 aircraft in the interceptor role also meant that the aircraft were less reliant on close control from air

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group moved about. Consequently, long-range bombers with cruise missiles remained a bigger threat to naval forces under way than ICBMs. Furthermore, in the late 1980s, the Air Force led the introduction of the new Joint Tactical Information Distribution System (JTIDS) data-link system. The system was first fielded on command and control platforms, with a gradual spread to air-to-air fighters. JTIDS is not one-way and directive from the command and control center to the fighters like the earlier air-defense Link-4. Instead, JTIDS shares information in a pool. Fighters can transmit data on their own aircraft location and targets that they have acquired with their own systems. Consequently, the pilots have more situational awareness with respect to where friendly aircraft are and where unknown or hostile aircraft are with respect to their own fighter. This emboldens the heroic warrior to make the claim that the information is provided for his tactical decisions and that he should make engagement decisions based on this information and not be directed by air battle managers. On the other hand, the visionary points out that the air battle manager and entire command and control system now have much more accurate information on both friendly aircraft and others, and still have the big situational awareness picture far beyond that which the surrounds individual fighter JTIDS scopes. In addition, the command and control system has intelligence feeds and other information that is not on the JTIDS, further increasing its awareness of the larger battle space. JTIDS is not tied into the fighter’s autopilot controls. The air battle manager can send commands over JTIDS, but the pilot receives the commands, interprets them and flies the aircraft. The impact of JTIDS on the heroic warrior versus visionary archetype discussion is unclear because JTIDS is relatively new. It is generations above the old F-106 data-link, and few pilots in service today had any experience with the F-106 anyway. Some air battle managers have distant experience with the Navy’s use of Link-4, but JTIDS is dramatically different. Finally, the Air Force officer corps’ apparent acceptance of the concept of the unmanned combat aerial vehicle (UCAV) could take this discussion in many different ways. For example, Soviet data-link equipped interceptors and Navy F-14s have both been used as “mini-AWACS,” controlling other, less capable fighters at the outer reaches of an air-defense-oriented command and control system. One might do something similar, *de facto* making a fighter pilot, or more likely a fighter weapons system operator, part of the command and control system controlling (through some mechanism) a flight of JTIDS-equipped UCAVs that thereby extend the entire command and control system.

battle managers. The newer fighters could acquire the targets with their onboard radars at extremely long ranges in comparison to the F-106 or even F-4. They also had better look-down capabilities and could detect targets that the ground-based air defense or AWACS radar might not. This meant that the modern fighters could take over the intercepts while still well beyond visual range from the targets, or run intercepts on targets that the command and control system did not see. In addition, the F-15s could interrogate the aircraft being intercepted for IFF responses, potentially eliminating the need for visual identification. These factors changed the relationship between the air battle manager and the pilot. The air battle manager was still the last link in the command and control system. However, the control became looser, with a broader application to tactical air warfare in general than the very tight control required to position the older strategic air defense fighter-interceptors into their extremely small weapons envelopes. The command and control system still provided early warning of an attack, detected aircraft entering US/Canadian airspace, and determined when intercepts were required for identification. Fighters, theoretically coming up from ground scrambles, still needed initial vectors and point outs to find their targets. In addition, they needed to know what type of intercept to run and what the aircraft was likely to be. Fighters were not on constant patrol in the air defense identification zones along the periphery of the US/Canadian borders. Even with the improved fighter radars, a defense based on this concept would be ineffective and very costly. On the other hand, there was obviously something calming to the public about manned fighters



flying combat air patrols over select cities in the aftermath of 9-11. In order to meet its societal responsibility and to maintain its jurisdiction of strategic air defense, the Air Force quickly scrambled fighters and AWACS to assume patrol stations under NORAD command—aircraft that could be seen, visibly protecting the nation.<sup>156</sup>

At the height of its glory, the strategic air defense system provided the capability for people on the ground to control not only fighter-interceptors, but SAMs and anti-aircraft artillery as well in a cohesive system. The command and control system had the deep-look radar picture and the means to identify and categorize incoming aircraft, thereby preventing fratricide of friendly aircraft returning from missions in a wartime situation. In addition, by being able to at least categorize aircraft into friendly, unknown or hostile, the intercept controllers could better manage the battle and also select the best tactics for each situation. Friendly aircraft did not require interception. Hostile aircraft could be engaged beyond visual range, and only unknowns required visual identification. A fighter without this knowledge would have to close to visual range on all targets. Intercept controllers literally had the big picture as well as the communications to most efficiently direct the entire air defense system in real time. Fighter-interceptors could be kept on ground alert, saving gas, and be scrambled when

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<sup>156</sup> NORAD, North American Aerospace Defense Command, is a bi-national (US and Canada) command, the commander of which has typically, but not always been the “triple-hatted” commander of the Air Force Aerospace Defense Command, the remnants of which evolved into Air Force Space Command, the commander of US Space Command (in existence since 1985), and the commander of NORAD. The preponderance of US Air Force involvement is clear. In addition, NATO provided some AWACS aircraft after 9-11, and Naval and Marine Aircraft also flew combat air patrols. Finally, a large part of the strategic air defense provided by the “Air Force” is actually provided by Air National Guard and Air Force Reserve Units.



required. Pilot opportunities for decision-making or to take “initiative” became more constrained, but not just in the strategic air defense mission.

#### Command & Control of Tactical Air Operations

There were parallels in the development of command and control of tactical flying operations, which included air-to-ground as well as offensive and defensive air-to-air missions. Strategic air defense protects the US and Canada from air attack, whereas tactical air defense missions protect friendly ground troops and maritime forces, allies, and air bases in the theater of combat operations. In both North Africa and Europe in World War II, tactical air forces were paired with ground forces units. Each of the Tactical Air Commands was tied to an Army and ran its own Joint Operations Center (JOC), with a supporting Tactical Air Control Center (TACC). The JOC developed the plans and sent out the air tasking orders with the missions, weapons loads, targets, and the level of effort to be given to various missions. Although the tactical air commands preferred to fly interdiction missions against enemy men and materiel beyond the friendly ground forces’ area of operations, the JOC was also the focal point for close air support missions, i.e. using aircraft to support troops in contact with the enemy. The TACC was the highest-level radar control facility in the tactical air control system, overseeing Control and Reporting Centers (CRCs) and the smaller Control and Reporting Posts (CRPs). This part of the system controlled the aircraft executing the daily air tasking orders and JOC-directed changes. Each tactical air command was responsible for all offensive and defensive air operations within its radar

coverage. The coverage was, however, limited. Consequently, in most cases, ground control over offensive air missions was not practical in World War II.

In the beginning, the Korean air war was fought largely the same way. In the offensive air-to-air arena, fighters would escort bombers or fly patrols, trolling for enemy fighters. If enemy fighters rose to the challenge, they had to be acquired visually as the Migs rolled in to attack the American fighters. This was not the optimum way to conduct air battles since it ceded the initiative to the Migs, who were under ground-based intercept control and vectored into attack positions. However, in a visionary move to extend the command and control system's radar and radio coverage along the Yalu, i.e., to support offensive, not defensive air operations, the Air Force put a Tactical Air Direction Center (TADC) on Cho-Do Island in June 1952. The TADC provided radar and radio coverage over the Mig bases on the Chinese side of the Yalu River; so intercept controllers could warn the F-86s when Migs were approaching and control the F-86s on offensive intercepts, directing the F-86s into position to attack the Migs. General Momyer reports that the US air-to-air kill rate went up dramatically after the TADC on Cho-Do went into operation.<sup>157</sup> Consequently, the command and control system, and specifically intercept controllers, could now direct fighters flying *offensive* counter-air missions at altitude over enemy territory. There was also a warning capability inherent in this set-up. Aircraft flying missions over North Korea could potentially be warned when the Migs were up and if they were headed their way,

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<sup>157</sup> Momyer, 156.

although the standard procedure was to have fighters up in a screen between the Yalu Mig bases and any friendly bombers or other aircraft conducting missions.

The overall tendency has been to use technology to expand the command and control system over evermore aircraft missions and phases of flight. For example, one of the first Air Force units deployed to Vietnam was a Control and Reporting Post (CRP), i.e., a mobile ground-based radar surveillance and control system, manned by US personnel, to Tan Son Nhut Air Base in January 1962.<sup>158</sup> By December 1962, the CRP at Tan Son Nhut was upgraded to a larger and more capable Control and Reporting Center (CRC). A subordinate CRP was established in the highlands in South Vietnam at Pleiku, and linked to a second CRC, which was established at Danang. "By the end of the year [1962], aircraft for the first time could be radar controlled in all areas of South Vietnam. This radar system remained throughout the war and was later enlarged by the establishment of two additional CRPs."<sup>159</sup> By the end of the war, the Air Force had positioned several radars in Thailand as well as in South Vietnam in order to expand the radar coverage not just for air defense and warning, but to maximize the radar, radio and control umbrella over fighter-bombers, attack aircraft and their escorting air-to-air fighters. The Air Force also brought over the EC-121, the AWACS forerunner, originally designed to supplement the SAGE system in NORAD. The EC-121 had a large-area surveillance radar as well as a height-finder radar, a

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<sup>158</sup> Momyer, 250. The "Farm Gate" special operations counter insurgency air unit was not deployed to Vietnam until October 1961, and was primarily involved in training; not taking on combat tasks until late 1962.

<sup>159</sup> Momyer, 254.



communications suite, intercept controllers and a partial command and control center capability. The EC-121 supplemented the ground-based radars, but was limited in its ability to filter out ground-clutter. In addition, Navy ships in the Gulf of Tonkin were also part of the command and control network. Consequently, the US had an extensive command and control network with coverage over parts of North as well as South Vietnam, Laos and Cambodia, at least at higher altitudes.

In addition, during night and bad weather, Air Force AN-MSQ-77 Radar Bomb Directing Central (MSQ) radar control sites controlled fighter and bomber strikes in South Vietnam, Laos, Cambodia and parts of North Vietnam. The controller would direct the aircraft's heading, altitude, speed and bomb release, without the fighters or bombers ever seeing the targets visually or with radar. This became the primary method for B-52 bombing after 1965 in South Vietnam because of its accuracy. The B-52s flying at high altitude could not see most targets with their radar, and ground-radar-controlled bombing was more accurate than using offset aim points. Under the Combat Skyspot controllers, B-52s bombed within one-sixth of a mile of the base perimeter at Khe Sanh during the North Vietnamese siege in 1968.<sup>160</sup> This situation is somewhat reminiscent of the air defense situation. Once again, the aircraft fly in drone-like fashion, following the commands of a controller on the ground, attacking a target that the crew did not necessarily ever see.

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<sup>160</sup> Momyer, 178-179, 218-219, 282-283; Carl Berger, ed., The United States Air Force in Southeast Asia, 1961-1973 (Washington: Office of Air Force History, 1977) 151, 156-157.

In addition, radio-relay aircraft and the airborne battlefield command and control center (ABCCC) aircraft let commanders on the ground stay informed about raids flown beyond the ground-based radar and radio coverage. General Momyer consistently makes the case that extending the coverage, which led to a higher degree of control over aircraft, was an important and very beneficial achievement:

The necessity for having positive control of the forces operating over enemy territory was demonstrated many times. With jet aircraft operating at such high speeds and with missiles permitting a greater variety of firing opportunities, control of the battle is more critical, complex, and demanding than ever.<sup>161</sup>

However, in his book, General Momyer takes an interesting twist after this statement. Immediately after stressing the need for “positive control,” he turns from the visionary to the heroic warrior perspective and states: “Through pilot skill, improvisation, and training, the air battle over the skies of North Vietnam was fought and won.”<sup>162</sup> In the long-term, however, the Air Force profession came to the conclusion that the command and control system was indeed important. The Vietnam experience resulted in a big change in emphasis on the future role of AWACS. AWACS was originally designed to supplement or take over SAGE sectors in strategic air defense missions. As the Air Force analyzed operations in Southeast Asia, however, the AWACS requirements

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<sup>161</sup> Momyer, 159.

<sup>162</sup> Momyer, 159. Momyer’s point is also interesting in that the general assessment of the Air Force office corps in the 1980s was that what Momyer calls “positive control,” or GCI (Ground-Controlled Intercept) was the Achilles heel of the Soviet air forces because Soviet pilots obviously lacked flying skill and initiative, living in a world where everything was controlled by intercept officers on the ground. Consequently, American pilots, flying the F-15 with a much more capable radar than the F-4, would rely on their initiative and wonderful aircraft and its onboard systems to defeat any future airborne adversaries in battle. “Positive control” was a sign of weakness, something that the Air Force had outgrown.

shifted to include the role of providing the big picture radar and radio control over aircraft flying in tactical combat operations. AWACS, which became operational in 1977, provides radar coverage from the earth's surface to high altitudes out to the radar horizon. Such a system greatly expands the area under "positive control" and would have filled most of the holes and gaps in radar and radio coverage during the war in Southeast Asia.

The Vietnam War brought other changes as well. The most obvious was the heavy use of the surface-to-air missiles (SAMs) by North Vietnam. The SAMs meant that the North Vietnamese did not have to contest the control of its airspace with fighters and antiaircraft artillery (AAA) as in World War II and Korea. SAMs were more accurate and could reach aircraft at higher altitudes than AAA. Consequently, SAMs denied the Air Force relative sanctuary at altitudes above accurate AAA fire. In addition, flying low enough to evade the SAMs meant a significantly increased risk of being hit by AAA. As a result, the Air Force needed some sort of defense against the SAMs. Defenses against SAMs, however, required both accurate and timely information on the SAM sites. The solution to these problems included a combination of measures. First, signals intelligence aircraft flew frequent sorties to identify SAM locations and modes of operation. If a SAM site became active, and for example went into a tracking radar mode, the intelligence aircraft could pass this information to the command and control system for broadcast to friendly aircraft, or the intelligence aircraft could potentially broadcast such information directly to aircraft at large.



Second, electronic warfare aircraft and bombers could jam specific frequencies and/or lay chaff to disrupt the tracking of friendly aircraft on strike missions. In addition, electronic warfare pods were developed for tactical aircraft to carry to jam specific radar frequencies. Carrying such pods became mandatory during the war, and different tactics were developed to maximize the use of the pods for protection. Finally, the concept of Wild Weasels was developed. The Wild Weasels were aircraft modified to scan specific frequencies and attack enemy radars with anti-radiation (anti-radar) missiles.

These systems increased the importance of the command and control system since more coordination and information was required. In the non-SIOP scenario, the command and control system, through the air tasking order, builds a SIOP-like plan for preplanned attacks on specific targets, setting targets, routes, timings, etc. As in the SIOP, this has become very complex, and for the same reason. Missions are interlocking, with aircraft and missiles from different services and operating locations each playing their part. If electronic reconnaissance aircraft or Wild Weasels were scheduled to support a strike mission, but did not arrive on time, the mission might be cancelled or diverted to other targets. Furthermore, if the raid package was delayed, jamming and chaff-laying needed to be delayed as well since doing either would telegraph the raid, and the chaff might blow away before the package arrived. Finally, it was important to know the exact locations of SAM sites and their characteristics so

that they could be effectively detected and jammed or attacked with the correct munitions.

In addition, the Airborne Battlefield Command and Control Center (ABCCC) was used to command, control and coordinate interdiction and close air support missions. The ABCCC was a capsule carried in specific C-130Es modified to support the ABCCC. The ABCCC had no radar, but was well stocked with radios and kept a running tabulation of missions and changes to the air tasking order. The ABCCC was responsible for deciding which targets to give to which fighters as they came up on the ABCCC frequency for guidance. In addition, the ABCCC typically had the authority to divert aircraft from one mission to another if fleeting, high priority targets were discovered. During interdiction missions over Laos for example, “if 7<sup>th</sup> Air Force intelligence developed a target of opportunity or if reconnaissance produced a ‘perishable’ target, the information was immediately passed to the ABCCC for execution.”<sup>163</sup> If the ABCCC did not have aircraft on hand to attack that target, 7<sup>th</sup> Air Force could divert other aircraft from other missions to the ABCCC for that purpose. For close air support missions, the ABCCC could also maintain communications with the Air Support Operations Center (ASOC), in which Air Force and ground forces representatives planned and coordinated the close air support missions.

Forward Air Controllers (FACs), flying in slow, propeller-driven aircraft, were used effectively in Korea to control the fighters attacking targets in support of, and in

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<sup>163</sup> Momyer, 203.

close proximity to, friendly ground units. In Korea, the Air Force used the T-6 aircraft for FACs. The FAC was tasked by the Air Force command and control system and maintained contact with the ground unit he was supporting, coordinating the overall situation, specific targets and the forward positions of friendly forces. In Vietnam, the concept was the similar, but FACs also became responsible for directing some interdiction missions as well. In addition, the command and control system was further extended down to the FAC with the addition of the ABCCC. In Vietnam, FACs flew the O-1 or O-2, and later the OV-10. The Air Force also used "fast FACs" flying in jet fighters over high risk areas. The FAC would be tasked to control fighters flying interdiction missions or to support an Army battalion. The air tasking order would task FACs with on-station times as well as target areas and contact information for the ABCCC. As the FAC flew inbound, the ABCCC would assign the FAC to a sub-area, where he might remain for several hours. Since FACs typically flew low and slow, they could better survey the target area. They would typically work the same general area in successive missions; so that over time they became familiar with its terrain and potential targets, and could report back to ABCCC enemy progress in repairing bridges, for example. In close air support missions the FAC, from his airborne vantage point, might also discover new targets in the area, unknown to the ground unit he was working with. The FAC could report these to both the ground unit and the ABCCC, which could pass that information back to headquarters and also decide on the priority of attacking the new targets.



Fast flying fighters tasked for close air support were given either planned target area times or designated ground-alert periods, during which they waited for target to be discovered. After takeoff, the fighters would be cycled through the command and control system to the ABCCC, who would assign them to a particular FAC. The FAC would paint them a verbal picture of the area, situation, and target, and perhaps shoot smoke rockets for the fighters to use as cues as he directed them onto the target in a high-speed run. The FAC would make a damage assessment and might direct the same or another aircraft to attack the same target, or move on to a new target. In any case, the fighter pilot's decision-making realm was severely constrained. The FAC selected the target, determined the target run direction, helped the fighter to acquire the target, and determined whether the target was adequately destroyed. The FAC also reported the results to ABCCC. In near drone-like precision, the fighter pilot did his best to hit the target—even though he probably never saw it! As General Momyer writes:

The greatest percentage of targets in South Vietnam were not visible to the fighter pilot because of terrain, jungle cover, or speed of the aircraft; usually it was a combination of all three. In most instances, the fighter pilots never actually saw the specific target because it was hidden in the dense vegetation of the jungle. These men had to rely almost entirely on the eyes of the FAC to get their ordnance on target. At all times, the FAC was the final air authority on whether or not the strike would continue. He was, in fact, the local air commander for the conduct of air operations, and his authority was recognized by the ground force commander and flight leader alike.<sup>164</sup>

The FACs became particularly important in Southeast Asia because there was no delineated battlefield. In World War II and Korea, for example, it was possible for

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<sup>164</sup> Momyer, 269-270.

the Air Force and other services to agree on a *bomb line* or *fire support coordination line*, an imaginary line beyond which no friendly troops were operating. This procedural method of command and control allowed pilots, as Builder pointed out, to freely attack any military forces they discovered beyond the bomb line. Of course, bridges for example, might not be open game if the ground forces planned to use them in the course of their advance. Nevertheless, this is the area that tactical air forces most prefer to operate in since they can attack practically anything of military significance. Inside the bomb line, however, friendly ground forces are likely to be operating, so attacks must be coordinated, through the command and control system, with ground unit commanders to minimize fratricide and to maximize the effect that the commander of the ground forces seeks. In Korea, the FAC became an important asset because the targets tended to be small, scattered across the front lines, and close to friendly forces. The rugged terrain in Korea and parts of Southeast Asia also limited the usefulness of ground-based FACs, leading to an emphasis on airborne FACs. The vantage from an aircraft was much more effective in detecting targets and changes in this environment. These factors were further amplified in the Vietnam War because of the lack of a front in the tradition sense. In addition, because there was more concern over the political ramifications of high numbers of civilian casualties, it became important to have somebody visually acquire and confirm targets.<sup>165</sup> Furthermore, the Air Force's transition to an all jet combat force after the Korean War meant that it was more

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<sup>165</sup> Momyer, 265-266, 276-277.



difficult for faster-flying pilots to visually acquire targets. Therefore, the FAC role expanded beyond the traditional close air support mission, and although the Air Force dabbled with the concept of fast FACs in jets, it still meant that the FAC, not the fighter pilot or the ground unit commander was in charge of close air support air strikes.

The trends evident by the end of the Vietnam War continue by and large into the present, although many names and acronyms have changed from Vietnam, through Desert Storm, Allied Force, and the current operations in Afghanistan and Iraq. The command and control system has continued to relieve the decision-making of the pilot in the cockpit. This is especially true in the realm of what was once called tactical or conventional warfare. The joint service agreement on the need for Joint Force Air, Land, and Naval Component Commanders under the theater commander before Desert Storm can be interpreted as a joint service endorsement of the Air Force position that one commander should have centralized command and/or control over all air-related assets used or available for use in the theater of combat operations. For example, the opening salvo of Desert Storm involved B-52s flying from the US firing conventional air launched cruise missiles, Navy Tomahawk Land Attack Missiles (TLAMs), Army helicopters, stealth fighters, and other aircraft attacking specific targets that dramatically reduced the Iraqi air defense system's ability to defend against successive waves of coalition aircraft. However, the Joint Force Air Component Commander (JFACC) position itself is no longer the automatic purview of the Air Force, although the Air Force has traditionally provided the command and control system for theater-wide



planning, directing and controlling air-related systems. The current name for the JFACC's centralized headquarters to prepare plans, issue the air tasking order and control current operations is the Combined Air Operations Center (CAOC). The CAOC, which typically tends to be concentrated at one location, has a big staff of intelligence personnel, operators turned planners and monitors, administrative and technical staffs, and frequently, liaison officers from all major units and services affected by the family of orders concerning air operations, which include, among others, the daily air tasking orders, airspace control orders and special instructions.

The CAOC also has extensive communication equipment, with data-link feeds from command and control sites and aircraft, as well as from reconnaissance aircraft or unmanned aerial vehicles (UAVs). AWACS provides the big-picture radar view of the friendly and enemy aircraft. This air picture can be shared with other AWACS, command and control facilities and the TACC (now CAOC). For example, the Gulf War Air Power Survey reports that, at least occasionally, the TACC was able to talk via secure communications to all four orbiting AWACS simultaneously while also receiving and displaying the air picture "from coast to coast."<sup>166</sup> Consequently, during Desert Storm or NATO operations over the Balkans, the JFACC could theoretically at any time, look at a screen and see where all the friendly and other known airborne radar contacts were. Improved reconnaissance platforms like the RC-135 Rivet Joint also

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<sup>166</sup> "Part II, Command and Control Report," Gulf War Air Power Survey, Volume 1, Planning and Command and Control (Washington: GPO, 1993) 74.

provide real-time information on hostile aircraft and other targets to the command and control system at large, and can also provide important threat calls to aircraft in peril. In addition, satellites for reconnaissance, missile warning, and communications support have been increasingly integrated into theater air operations.

The ABCCC was still in use in Desert Storm and over the Balkans, coordinating close air support with the ground forces. In Desert Storm, the E-8 Joint Surveillance Target Attack Radar System (JSTARS) aircraft was used operationally for the first time on a test basis. JSTARS' own radar produces a picture of vehicles and targets on the ground. This picture is data-linked, thereby directly increasing the command and control system's situational awareness and targeting ability for close air support and interdiction missions. FACs still play a role in close air support missions, but the platforms have changed to the OA-10 and F-16. The change in aircraft gives them an armed reconnaissance capability since they are no longer the unarmed, exclusively command and control node of the past. This leans toward the heroic warrior archetype. However, weapons technology also plays a large role in the evolution of command and control of close air support missions, pulling them toward the visionary archetype. First, the development of buddy lasing by FACs and later of hand-held laser designators, both of which still required the pilot to place the missile in a position to acquire the designator's reflection, gave the target selection and aiming responsibility to the command and control system. The GPS-navigated JDAMs just require the aircrew

to load or monitor the automatic input of the target coordinates and release the munition when in range, which further reduces the aircrew's involvement in the process.

Currently, at least in the campaigns in Afghanistan and Iraq, the technology of hand-held laser-designators and GPS calculators for JDAMS targeting has given personnel, who are integrated in ground units, direct control over the actual targeting of munitions launched in their support. For example, the particular circumstances of the campaign in Afghanistan created instances where a Special Forces unit essentially had a B-52 tagging along, dropping JDAMs wherever and whenever the enlisted terminal attack controller asked and sent up the coordinates. No intermediary FAC was used. It was in many ways the epitome of a transformed military, at least from an Army perspective. Small, light ground units moving across terrain, encounter fire. They quickly identify the target coordinates and make a radio call. Minutes or seconds later, a JDAM falls out of the empty sky, destroys the resistance, and the unit moves on. The B-52 pilot is irrelevant with respect to the management of the organized violence. Conceptually, the B-52 could have just as easily been a drone JDAM carrier.

### Conclusion

The heroic warrior likes to link himself to the images of the scarf-in-the-wind World War I era biplane pilot and of the knight of yore. These are brightly colored images, knights in silver, with embroidered flags, saddles and shields; or leather-clad pilots in multicolored biplanes—not images of industrial-age warfare with massive factories, huge armies and burning cities. The images are associated with chivalry,



mastery of one's steed and one's equipment, and glory through individual combat. However, the trenches below and the aircraft themselves were byproducts of the industrial age. Consequently, it is more fitting to attribute the Air Force's founding mythos to the independent, strategic bombing campaign—mass-produced airplanes in thousand-plane raids streaking across Nazi Germany, bombing cities into oblivion. The practical application of airpower does not rest on individual combat, but on independent air operations. Independent operations means that aircraft and missiles should be centrally organized, equipped, planned, and commanded to achieve specific objectives, which may or may not directly support ground and surface forces. This maximizes the effectiveness and efficiency of aircraft and missiles to attack targets that are beyond the pale of the imagination of a traditional ground or surface commander, at least partly because the range of action is so much broader and the speed of reaction so much faster than anything possible on land or on sea. Without aircraft, missiles or radio-electronic means, a ground or naval commander cannot think of shutting down the enemy's electric power grid in its capital or isolating the enemy leadership from its forces and population. Consequently, the basis of independent air operations is not individual combat, but the most centralized and controlled system as possible over all air and missile assets. This allows the most flexibility and synergy in planning and achieving specific objectives.

The amount of command and control exercised by the system outside the individual cockpits has evolved over time and is closely tied to technological advances.

In the beginning, planning and procedures were the avenues of control, but radios, radar, computers, and data-links have all been the basis of significant advances in off-board command and control over pilots and aircraft conducting combat operations. Strategic air defense initially took the lead in terms of the sophistication and the intrusion into flying operations since strategic air defense missions could be expected to take place entirely within friendly radar and radio coverage. However, tactical radars were quickly put to use providing air defense for tactical forces. In addition, they were used to provide coverage and some control over aircraft flying offensive air missions in Korea and Vietnam. The EC-121 with its airborne surveillance radar was used in Vietnam in an attempt to increase radar coverage over the entire area, and AWACS has been a constant in all air operations since its inception in the late 1970s. Special ground radars were used to control B-52 bombing over South Vietnam. Finally, FACs played a critical role in directing fighters flying close air support missions from Korea through today, supplemented by the ABCCC and the JSTARS.

In addition to the radars, and command and control aircraft, the entire CAOC system, as the focal point of C4ISR, has become the basis of Air Force operations. Planning itself has become very complex with the requirements to mix electronic warfare, tankers, and other aircraft into supporting groups or raid packages in order to successfully penetrate enemy integrated air defense systems. The complexity rivals the SIOP system with interlocking missions, and Air Force officers have long grown accustomed to the CAOC, Air Tasking Orders, and the command and control system. If

a tanker or other support aircraft aborts its mission, the entire raid may be cancelled because it will not have sufficient fuel; and if aircraft that were tasked to eliminate an enemy SAM system before the raid were unsuccessful, the raid may be cancelled as well. The resources in terms of personnel and equipment required to coordinate, to plan and to control the execution of the Coalition's 2400-3100 sorties per day during Desert Storm was immense. And there has been no let down in the centralization of the CAOC-based command and control system, with the CAOC in Qatar, for example, running all air operations in both Afghanistan and Iraq, with an infusion of new systems such as the Predator UAV feeds, and more control over space-based assets. Technology both justifies and allows the growing intrusion of the C4ISR system into the cockpit, with the simultaneous decrease in the potential realm of pilot decision-making. This in turn elliptically calls for a reevaluation of whether piloting provides the skill set that should dominate the officer corps' sense of expertise and leadership.

The CAOC is an Air Force product, largely manned by Air Force personnel, but with some degree of command and control over all airborne assets in a theater of operations. A CAOC C4ISR system orchestrated the opening attacks of Desert Storm, which included B-52s flying from the US, Navy Tomahawk Land Attack Missiles (TLAMs), Army helicopters as well as a variety of Air Force, Navy, Marine and allied aircraft stationed throughout the Gulf region. This expertise is the bedrock of modern airpower and it clearly embodies the concept of managing an organization achieving objectives through the application of, or the threat of, violence. The Air Force must not



only maintain and expand this expertise; it must seek to expand its near monopoly of jurisdiction against competition from other services as well as from potential enemies. Despite lingering jurisdictional disputes with the other services on seam issues such as the exact amount of subordination to or coordination with the CAOC over Army helicopter operations or Marine close air support missions, the Air Force appears to have a near monopoly on the jurisdiction of the joint air and space C4ISR system. In many ways, this jurisdictional claim is much more unique than Air Force claims to jurisdictions over aircraft, missiles and satellites in general. In addition, the basic expertise and jurisdiction over the joint air and space C4ISR system provides the basis of the Air Force's expansion beyond electronic warfare into information warfare in order to counter potential enemy integrated air defense systems and to continue to have the capability to strike deeper and faster against less orthodox targets in the enemy's hinterlands than other services. The C4ISR system is the bedrock of visionary forms of warfare.

## **Chapter 7: Structural Factors and Traditions Led to the Pilot Overrepresentation**

### Introduction

Up to this point, I have provided background information on the concept of profession, created a working descriptive model of profession, and examined Air Force officer corps' fields of expertise and jurisdictions. My basic contention is that there has been a shift in the locus of decision-making away from the pilot in the cockpit to the C4ISR system. This in turn, points to the rising importance of C4ISR as the Air Force officer corps develops this new expertise, thereby creating and filling a new jurisdiction. The logical conclusion would then be that the Air Force officer corps, in full awareness of the trend, is moving to adjust itself accordingly, and general officers are perhaps even leading the change. One would then expect more C4ISR officers and more C4ISR generals as the role of pilots and numbers of pilots shrink. One might expect some opposition, perhaps characterized in terms of organizational culture or bureaucratic politics theory, as the once-dominant pilot group struggles to retain power despite the diminishing importance of its particular skill within the overall profession. In general, though the trend would be pilots decreasing in numbers and status while C4ISR officers concurrently rose in numbers and status. After all, General Hap Arnold, Commanding General of the Army Air Force during World War II, summed this all up when he told his staff late in the war:

The pilot will not always be the key to airpower. For the present, yes. For the immediate future, yes. But even now mechanical gadgets are fast encroaching on the pilot's domain. We are entering the era of the guided missile.

Someday, perhaps in our time, the man holding my job will meet here with a staff of scientists, and they will wear no pilot's wings on their chests. That insignia will cease to be the yardstick of Air Force achievement. That's something for you to think about.<sup>167</sup>

Needless to say, that is not quite how things developed between 1947 and 2003.

Whereas the percent of the total Air Force officers who are pilots on flying status has decreased from 50% in FY1948 to 19% in FY2003, the percentages for general officers went from 88% to 63%.<sup>168</sup> However, as the percentage of pilot general officers decreased, the overrepresentation of general officers who are pilots on flying status remained fairly constant in the 40-50% range. The profession's membership is definitely changing, but pilot wings still appear to be a major yardstick of Air Force achievement, if now only in the highest, general officer, ranks. Consequently, the issue is what factors led to an overall decrease in the percentage of pilot general officers, while retaining a fairly constant overrepresentation. The explanation of the overall decrease in the percentage of pilot general officers lies in the concept of professions and the changing expertise and jurisdictions of the Air Force officer corps. That was the subject of the first and second parts of this manuscript. The explanation for why pilot general officers have been able to maintain their overrepresentation while it has disappeared in the lower ranks lies in structural factors and traditions that led to and maintained the pilot overrepresentation. That is the subject of this third part of the

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<sup>167</sup> Ben Pearse, "It's Still His Air Force," Air Force Magazine Aug 1956: 261.

<sup>168</sup> The percentage of general officers who are pilots on flying status did hit an all-time low in FY 1998 of 59% and hovered around 60% from FY1997-FY2002, before climbing in FY2003.



manuscript. This chapter in particular deals with two early Air Service and Air Corps stratagems to increase their independence that became public law, and thereby restricted the independent Air Force officer corps' ability to evolve. The first of these was the concept that the Air Service officer corps should be 90% flying officers, and the second was that only pilots could command flying units. This is followed by two case studies of the navigator and air battle manager (ABM) career field's difficulties overcoming these obstacles, as well as a short look at the impact of the Air Force tradition of badges and wings. The next chapter, Chapter 8, will examine the impact of the Aviation Cadet Program on the officer corps and the sources of general officer's commissions. It will also look at the Air Force tradition of carrying an active-duty pilot reserve cloaked in non-pilot billets and the issue of how many pilots the Air Force officer corps actually needs, before addressing concerns of a promotion system bias in favor of pilots.

#### Stratagems to Increase Independence Restricted Officer Corps Evolution

The officer corps of the Air Service, Air Corps, and Army Air Forces used a variety of stratagems in its decades-long struggle for independent professional status. However, many of those stratagems that were once considered necessary for the basic survival of a quasi-independent air force have become structural constraints on the professional evolution of the Air Force officer corps. The revolutionary advocates of an independent air force were fighting to simultaneously create the expertise of airpower, embodied in strategic bombing, the jurisdiction of independent air operations, and the profession to fill this new niche—the independent Air Force. All three creations were

tightly interwoven. Strategic bombing depended on developing aircraft, navigation systems, weapons, crews and a command and control system capable of conducting the big bomber raids of World War II. However, in order to develop all of this without the intervention of World War II, independent air force advocates would have needed the Army to have either provided them unlimited resources or to have released them to form an independent air force which would then compete directly with the Army for funding, while claiming that the independent air force made the Army redundant. The Army of course did not see either course to be in its interest and saw a need for aircraft to support ground operations.

Consequently, air power advocates turned to the public and to its representatives, the government, to make the case for a new jurisdiction. This new jurisdiction, air power acting independently of Army and Navy forces, primarily for strategic bombing of the enemy homeland, of course had to be filled by a profession with the necessary skill set. In addition, the strategic defense of the US also required air forces that are independent of ground and naval operations since the air forces would primarily be defending against enemy aircraft. Furthermore, since both the Army and Navy were bureaucratically opposed to a new competitor advocating heavy spending in unproven technologically advanced systems in accordance with a speculative doctrine, neither could be entrusted with this new professional niche that was so important to the nation's defense. Only the new breed of cat, the aviator, could provide this in a way that would really protect the nation. Any socially responsible senator or representative

naturally should have seen that enemy airpower was indeed the real threat to the future survival of the US and its way of life. European, Soviet or Japanese armies could not march over the North Pole to strike Chicago, and enemy naval forces could do little more than harass the coasts before being driven off and sunk by aircraft. Enemy long-range bombers on the fringes of development, however, would soon be able to strike deep in the American homeland. From this perspective, it was easy to recognize that there was now a significant void in the jurisdiction of national defense. The professions of the Army, Navy and Marine officer corps had previously been granted specific pieces of jurisdiction within the overall national defense umbrella. However, since there was clearly a precedent for matching a profession to a particular jurisdiction and because the existing professions' officer corps appeared reluctant to truly fill this void, the only logical solution was to support the development of a new profession—the independent air force led by its independent officer corps—which would in turn be granted this new jurisdiction.

Neither the public nor the government bought the argument hook, line and sinker, but it was clear where the airpower advocates wanted to go, and Congress took steps that moved gradually in the direction of an independent air force. In 1914, before there was any great interest in an independent air force, Congress established the *aviation section* within the Signal Corps of the Army, limiting it to 60 aviation officers and 260 aviation enlisted men, all of whom were extra and above the Signal Corps' old ceilings. No grade distributions were mandated. Officer aviation students had a



maximum of one year to prove “their fitness or unfitness for detail as aviation officers,” and aviation officers were to be generally detailed for four years to the aviation section.<sup>169</sup> All officers within the aviation section were called *aviation officers*, and the aviation section was basically given all Army things flying with a minimum of guidance on what that would entail but a clear recognition that this flying business was dangerous.<sup>170</sup> The act also created three ratings: Junior military aviator (officer); military aviator (officer); and aviation mechanician (enlisted). The term “pilot” never appears in the act. Indeed it is not clear whether aviation officers were expected to be jacks-of-all-trades, flying an airplane one day, observing from a balloon the next, or if they might specialize in some way. Junior military aviators simply had to demonstrate in flights “that they are especially well qualified for military aviation service.”<sup>171</sup> The rating of military aviator was restricted to 15 officers in the aviation section and required three years service as junior military aviator. Officer aviation students had to be unmarried, lieutenants of the line, and not older than 30. Up to twelve enlisted men at any time could “be instructed in the art of flying,” but it is not clear what rating they were to receive, if any. The danger of the activity was highlighted by the rewards. Officer aviation students were to be paid 125% of their pay, junior military aviators were advanced one rank up to the rank of captain and additionally paid 150% of the

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<sup>169</sup> Aviation Service Act, Pub. L. 63-143. 63<sup>rd</sup> Cong. Ch. 186. 18 Jul 1914, Stat. 38-514, pp. 514-515.

<sup>170</sup> The Aviation Section was “charged with the duty of operating or supervising the operation of all military air craft, including balloons and aeroplanes, all appliances pertaining to said craft; and signaling apparatus of any kind when installed on said aircraft; also with the duty of training officers and enlisted men in matters pertaining to military aviation.” See Pub. L. 63-143, p. 514.

<sup>171</sup> Pub. L. 63-143, p. 515.

new rank's rate, and military aviators were also advanced one rank up to the rank of captain and paid 175% at that new rate. Enlisted aviators and aviation mechanics were paid 150% of their rate. Widows, or a designated beneficiary, were to be paid one year's pay upon the death of an aviation officer or enlisted man due to an aviation accident, in which the military member was not at fault.<sup>172</sup> The concept called for a rotation of young, unmarried officers through flight training, with the graduates having the opportunity to fill aviation section billets for up to four years. This was a beginning, but the restrictions on marriage, age, and rank, coupled with the rotational concept, could not provide the basis for the development of a core profession. Flying was apparently something that a number of junior officers should be exposed to, but their careers remained tied to their root branch in the Army.

In the National Defense Act of 1916, Congress specified that a colonel would command the aviation section within the Signal Corps and that there would also be one lieutenant colonel, eight majors and 24 captains in addition to the 114 first lieutenants in the aviation section. In addition, flying shed its monastic image—flying officers were no longer restricted to being unmarried, or to specific ranks or ages. The cap on enlisted flying was also removed. Furthermore, the grade of Aviator, Signal Corps, was created for direct civilian entrants to make up for any shortfalls in officer flying personnel, but tied to the rank of master signal electrician for pay scales. The pay scales

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<sup>172</sup> Pub. L. 63-143, pp. 514-516.

of aviation officers, junior military aviator and military aviator remained at 125%, 150% and 175% respectively, and junior military aviators and military aviators on flying status were advanced one rank up to the rank of major.<sup>173</sup> Consequently, the aviation section now had prospects to grow an independent officer profession. First of all, it could now generate aviators directly from civilian status, instead of being limited to lieutenants of the line already serving in other Army branches. In addition, legislation mandating aviation officer positions in the field grade ranks meant that at least some aviation officers could potentially stay in the aviation section and not return to their original Army branch. The removal of the age and grade restrictions had the same effect. Finally, removing the restriction on married officers also mainstreamed career prospects within the aviation section. However, except for the lieutenants, the 1916 act did not specify that any of the captains or field grade aviation officers actually have any rating, and the junior military aviator and military aviator ratings were still legislatively undefined.

The 1920 Amendment to the 1916 National Defense Act, was a significant milestone in the development of an independent aviation officer profession. Congress elevated aviation's status by establishing the Air Service, independent of the Signal Corps, with the Chief of the Air Service having the rank of major general and his single assistant being a brigadier general. Flight pay for officers and enlisted was standardized at 150% of one's pay. The Air Service was given 1514 officer billets in the ranks of

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<sup>173</sup> National Defense Act, Pub. L. 64-85, 64th Cong. Ch 134, 3 Jun 1916, Stat. 39-166, pp. 174-176.



second lieutenant to colonel, and 16,000 enlisted billets, of which not more than 2,500 could be flying cadets. In a new twist, a maximum of 10% of the officers below the rank of brigadier general “who fail to qualify as aircraft pilots or as observers within one year after the date of detail or assignment shall be permitted to remain detailed or assigned to the Air Service.”<sup>174</sup> Consequently, the Air Service’s officer corps was intent on making itself into a very flying-centric organization. If an officer could not qualify as a pilot or observer within one year, he should generally be thrown back to his original Army branch. The Air Service officer corps was to be populated by flyers, either as aircraft pilots or as observers, at the rate of 90% or more. At the time, the Air Service officer ranks were swollen with more than 25% non-flying officers.<sup>175</sup>

However, the Chief of the Air Service and his deputy were not required to be flying officers. The second new twist in the act was the statement that, “Flying units shall in all cases be commanded by flying officers.”<sup>176</sup> The term *flying officers* was not defined in the act, but the implication was that it included aircraft pilots and observers, since officers with those ratings could remain in the Air Service without restriction. The 1920 act’s section on the Air Service was formulated in accordance with the requests of the Air Service’s leadership. The act’s two new provisions set personnel courses that the Air Corps took to even further extremes, and which the independent Air Force has

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<sup>174</sup> National Defense Act Amendment, Pub. L. 66-242, 66<sup>th</sup> Cong. Ch. 227, 4 June 1920, Stat. 41-759, p. 768.

<sup>175</sup> Vance O. Mitchell, Air Force Officers Personnel Policy Development 1944—1974 (Washington: Air Force History and Museums Program (GPO), 1996) 353.

<sup>176</sup> Pub. L. 66-242, p. 769.

found difficult to alter. The first concerns the issue of officer manning—and the goal of an officer corps that is 90% or more flyers, and the second the issue of command—and the requirement that flying units be commanded by flyers.

#### 90% of the Air Service Officers Should be Flying Officers

With respect to manning, the Air Service/Corps continued to press for legislation that would enable its officer corps to approach as much as possible the goal that every officer be a *flying officer*, and indeed with the 1920 act's requirement for commanders of flying units to be *flying officers*, a lot hung on the definition of the term *flying officer*. The Air Corps presented an explicit definition of the term *flying officer* in the 1926 Amendment to the 1916 National Defense Act. A *flying officer* was defined “as one who has received an aeronautical rating as pilot of service types of aircraft,” during time of peace, but “in time of war may include any officer who has received an aeronautical rating as observer.”<sup>177</sup> This definition made the term *flying officer* synonymous with the term *pilot*. The US was at peace and expected to be for the foreseeable future; so an observer rating became almost meaningless. The Air Corps, however, wanted to hedge its bets, realizing that in time of war, pilots might be scarce or inexperienced, so an experienced officer with an observer rating might be better than a new pilot or totally ground-bound officer. The 1926 act further restricted the definition of future peacetime *flying officers* to pilots of heavier-than-air craft with a

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<sup>177</sup> National Defense Act Amendment, [Public—No. 446—69<sup>th</sup> Congress] [H.R. 10827], 2 Jul 1926 (Washington: GPO) 2.

minimum number of career total flying hours, while concurrently grandfathering in all officers in the Air Corps with any type of pilot rating, including airship pilots, as *flying officers*.<sup>178</sup> Officers with only observer ratings were a dwindling commodity as the Air Corps implemented a system in which observer training and ratings were given to officers after they had qualified and earned pilot wings.

From its inception, the Air Service, together with Congress, continued to tweak the wording of provisions that required that a minimum of 90% of the officers in the Air Service be *flying officers*. This goal proved to be impossible to meet during World War I, but the 1920 amendment to the 1916 National Defense Act was effective in reducing the number of non-flying officers, or non-pilots to well under the 10% allowable maximum level. When Major General Patrick testified before the Senate Committee on Military Affairs on this issue and on the wording in the House Resolution proposing to amend the 1916 and 1920 national defense acts, he reported that the Air Service in the spring of 1926 only had twelve non-flying officers—out of approximately 900 total officers.<sup>179</sup> That is, 98.7% of the total Air Service officers were *flying officers*, i.e., pilots according to the 1926 definition. In addition, the 1926 amendment continued the 1920 act's concept that officers detailed from the rest of the Army to the Air Corps for flight training had to be qualified as flying officers within one year, or be returned to their original branch, unless the Air Corps wanted a particular officer to stay and

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<sup>178</sup> Public—No. 446—69<sup>th</sup> Congress, 2.

<sup>179</sup> US Senate, Committee on Military Affairs, The Army Air Service Hearing on H.R. 10827, 69<sup>th</sup> Congress, 1<sup>st</sup> Session, May 10, 1926 (Washington DC: GPO, 1926) 8.



occupy one of the up-to-ten percent of the total officer billets that could be held by non-flying officers.

Furthermore, the 1926 act restricted the number of officers in any military service that received flight pay to 1% “exclusive of the Army Air Corps, and student aviators and qualified aircraft pilots of the Navy, Marine Corps, and Coast Guard.”<sup>180</sup> This provision clearly limited the ability of officers outside the Air Corps to gain or maintain any flying skill. Congress effectively restricted the expert knowledge of flying to the Air Corps and the flying elements of the Navy, Marine Corps and Coast Guard. This concurrently supported the development of an Air Corps professional sense of corporateness separate from the Army officer corps at large. Finally, Major General Patrick adamantly maintained in the face of several senators’ incredulity that the Air Corps did not need or want 10% of its officers to be non-flying, even in times of war: “In the mobilization plans we have made and where we have figured in the amount of nonflying personnel we need, the number is less than 10 per cent.”<sup>181</sup> In fact, when pressed on the percentage of non-flying officers in World War I, Major General Patrick replied, “That is scarcely a criterion. I can not answer the question; but they were learning to fly. Probably half of them.”<sup>182</sup> Consequently, in spite of a wartime track record of half of its officer corps performing non-flying functions or in training, the Air Service/Corps officer corps was hard over that a pilot rating was all but a requirement

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<sup>180</sup> Public—No. 446—69<sup>th</sup> Congress, 3.

<sup>181</sup> US Senate, The Army Air Service Hearing on H.R. 10827, 16.

<sup>182</sup> US Senate, The Army Air Service Hearing on H.R. 10827, 15.

for admittance to the profession. The entrance requirement did not translate to a requirement for all pilots to maintain their flying currency, however. Once an officer received a pilot rating, he was considered a pilot, regardless of whether he was currently qualified, current and receiving flight pay or not.<sup>183</sup>

In his Annual Report for FY1930, Major General J.E. Fechet, Chief of the Air Corps, reported that on 30 June 1930, 94% of the Air Corps commissioned officers were pilots, 6% of which were airship pilots. Only 1% of the commissioned officers had no flying rating, another 1% of the commissioned officers were observers, and the remaining 4% were currently in flying training.<sup>184</sup> The general concept that over 90% of the Air Service/Corps officers be *flying officers* continued through the 1936 amendment to the 1916 National Defense Act. The long-lasting effect of the 1926 stipulation that only pilots are considered *flying officers* in peacetime can be seen as late as 1939, when the Air Corps consolidated the requirements for aeronautical ratings and established the new ratings of command pilot and senior pilot. The requirements to be a

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<sup>183</sup> When asked about how pilots disqualified for age are counted, Maj Gen Patrick replied, "No, sir; they are not retired for disability. They are still regarded as flying officers within the provisions of the law, Senator Reed. They are not disrated, nor are they retired or taken out of the corps at all. They still fulfill the definition of a flying officer." With respect to flight pay, Maj Gen Patrick then went on to explain that some of these officers might still get flight pay as observers even though disqualified by age for pilot duties. "It has been thought that in future wars the man who commands air troops in the air would not necessarily pilot his own machine; in fact, he probably would not. He would give his entire attention to commanding the air force and would be flown by some one else. So there is a chance there for them to use the knowledge they have acquired in a proper fashion in commanding air troops in the air, although they themselves do not pilot the machines in which they ride." This is a remarkably prescient description of the future Air Battle Manger career field—although it actually became part of the definition of the command pilot rating for many years. See US Senate, The Army Air Service Hearing on H.R. 10827, 10.

<sup>184</sup> Major General J.E. Fechet, Annual Report, Chief of the Air Corps, Report to the Army Adjutant General, 22 Aug 1930, p. 5.



combat observer are either to already have the airplane observer rating and be grandfathered in, or to first earn a pilot rating and then establish observer credentials. Since the National Guard granted the observer rating to non-pilots, "Combat Observer ratings awarded federally recognized officers of A.C. [Air Corps] units of the N.G. [National Guard], who are not rated pilots, will be recognized only during the tenure of their commissions as federally recognized officers of A.C. units of the N.G."<sup>185</sup> The combined effect was to make the terms *flying officer*, *rated officer*, and *pilot* equal, with non-pilot observer ratings holding an anachronistic place in the hierarchy of non-pilot officers.

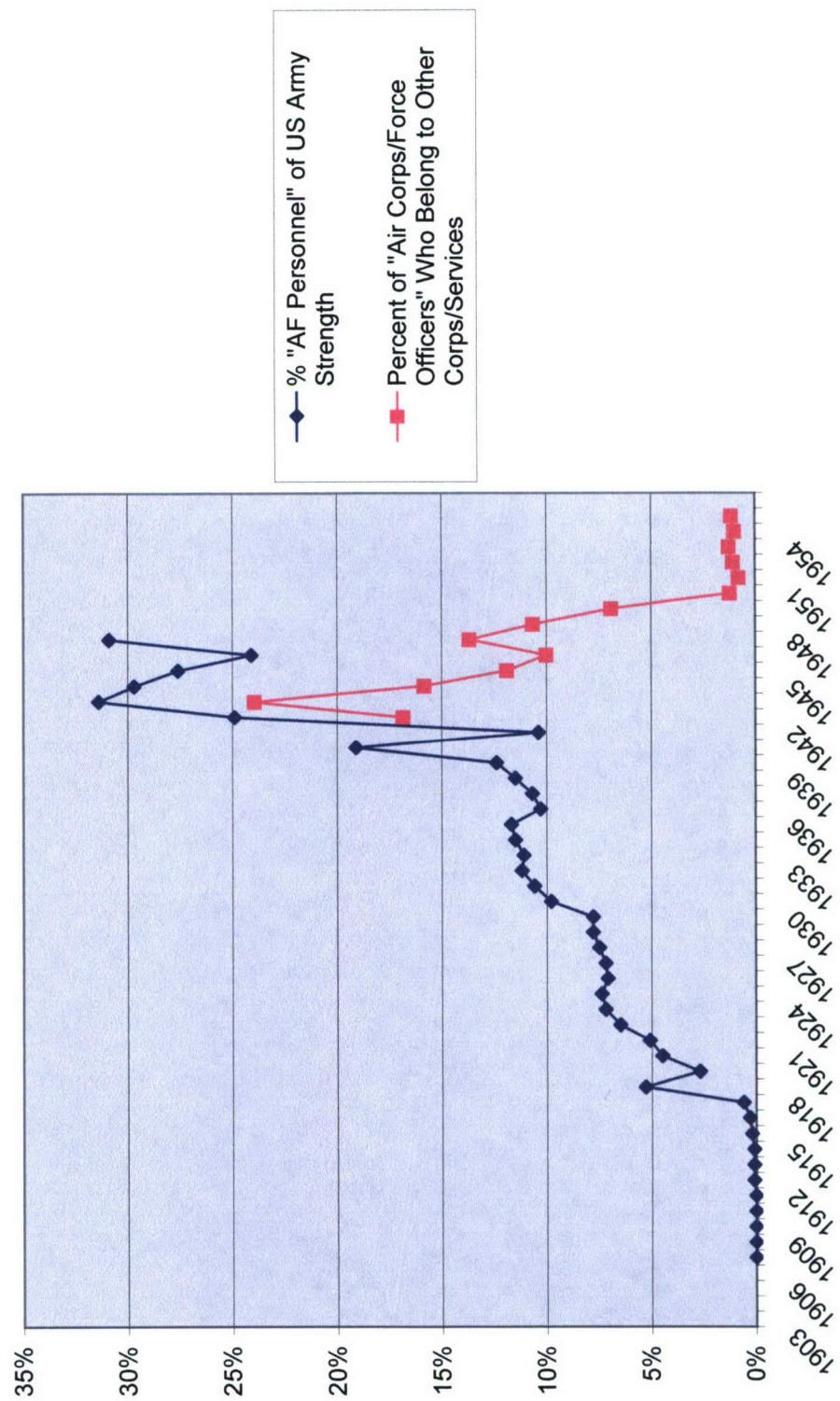
The Air Service's/Corps' officer corps' personnel policy goal of a commissioned officer corps that consisted of between 90% and 100% pilots was only practical given specific conditions. The first and perhaps most important factor was that the total Army officer corps was divided along functional lines into a myriad of branches. Consequently, the Air Corps could remain pristine and pilot-dominated, but borrow officers from the Quartermaster Corps, the Corps of Engineers, the Chaplain and the Medical Corps, etc., for support. For example, Chart 7-1 (Comparison of the Percent of Total Army Personnel Serving in/with the Air Service, Corps, or Forces and the Percent of "Air Force Officers" Belonging to Other Corps or Services) shows the

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<sup>185</sup> See Attachments 1 and 2 to Major General Robert T. Ginsburgh (Chief Office of Air Force History), letter to Lt General Charles B. Westover, 9 Dec 1971, Office of Air Force History, Anacostia Annex (USN), DC. The letter concerns the connection between Westover's father's accident in September 1938 and the establishment of command pilot and senior pilot ratings. Similar wording is also to be found in Attachment 4: Office of the Chief of the Air Corps, War Department, Air Corps Circular 50-11, Training, 21 Nov 1939, pg. 2.



**Chart 7-1: Comparison of the Percent of Total Army Personnel Serving in/with the Air Service, Corps, or Forces and the Percent of "Air Force Officers" Belonging to Other Corps or Services**



growth of Air Force-type personnel as a percentage of the total Army personnel, as well as the percent of officers serving with the Air Corps/Force that actually belong to other branches, corps, services, and eventually from the Army in general once the Air Force was independent. The first, generally ascending curve shows that the total “Air Force” percentage of Army personnel climbs steadily, but moderately from 3% in FY1919 to 12% in FY1939, before it explodes from 10% in FY1941 to 31% in FY1943. This percentage, however, includes enlisted as well as officers. Within the officer corps, it includes not only pilots, navigators, and flying-connected officers such as those leading aircraft maintenance units, but also generic officers providing administrative services as well as officers from other Army branches such as the Signal Corps. Consequently, this curve is inflated in the sense that the Air Corps/Forces/Force officer corps did not consider all these officers to be part of its membership, and from the Army’s point of view, many of them were not. On the other hand, however, the Air Corps/Forces/Force could not operate without them. The second, descending curve on the graph illustrates this flip side. In 1943, 24% of the officers serving with the Air Corps were actually officers from these different, supporting branches. In fact, the Air Force officer corps continued to rely on supplementary officers, primarily from the Army, through 1955. By that time, the Air Force officer corps had established its own officer training and career tracks to provide these services—but, of course, the Air Force officer corps could no longer aim for the ideal of 90% to 100% of its officers being pilots.



A very limited organizational size, limited technological change, and peacetime were three other factors that enabled the Air Service/Corps officer corps cling to the ideal of 90% or more pilots in its ranks. During his testimony in 1926 Major General Patrick put the Air Service/Corps officer total at approximately 900. An organization of this size, with less than 9000 enlisted men, allowed time for officer pilots to take on other duties, such as administration or maintenance, in addition to, or in some cases, to the exclusion of their flying. After all, the intent was to have every officer earn pilot wings, not necessarily that they all be qualified and current to fly combat missions every single day.

Technology did not become an issue until the Air Corps/Forces began to actually receive the big, multiengine bombers of the types used so successfully in World War II. If these bombers were indeed going to be flown hundreds of miles across oceans and deep into enemy territory, they could not rely on the enemy to place navigational aids along the way for the bombers' use. A crewmember was required to navigate and track the aircraft's position. Mastering this skill required considerably more training than that previously required for the observer rating. In addition, most bombers also required a crewmember to act as a bombardier. Although these crew positions could have been manned by pilots, the duties could not realistically be performed by the pilot and co-pilot flying the aircraft. It was economically inefficient to tie up two extra pilots, with high training costs, to perform other in-flight functions. Furthermore, pilots were not keen on performing non-pilot functions. After all, they



were pilots!<sup>186</sup> In addition, the navigator position in particular arguably required a more mathematically astute and therefore potentially higher educated officer than the pilot candidate standard. As the inventory of large, crewed aircraft began to expand, the Air Corps began to train aviation cadets solely as navigators in 1940.<sup>187</sup> Consequently, the big bomber, the aircraft that made the theory of strategic bombing a viable proposition, was ironically also a key factor in the Air Corps/Forces/Force begrudging shift away from an all-pilot officer corps. World War II was the last factor contributing to the conceptual broadening of the Air Force officer corps' composition. The big buildup meant that every available pilot was required to fly, either as an instructor, airlifter, or combat pilot. A pilot doing administrative support work as his main task was a waste. Draftees with education and experience in a variety of fields could more effectively and efficiently become for example statistics officers, financial officers, or intelligence officers than pilots doing it part-time or as a hobby.

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<sup>186</sup> According to a circa 1943 Aviation Cadet recruiting brochure, "Mechanical aptitude, unusually quick reflexes, perfect physical coordination, and the ability to make rapid decisions are desirable in the applicant who wishes to become a pilot. A knowledge of mathematics and some experience in the field of applied sciences are useful." Furthermore, concerning pilots, "His is the spectacular role," but the training is "grueling" and the longest (36 weeks) of all aircrew members. On the other hand, the navigator "is the man behind the man at the controls, and his instructions enable the pilot to guide the ship directly to its objective." The navigator course is a mere 33 weeks long. "A definite mathematical bent is essential, and it is desirable that pre-Cadet training should have included a sound fundamental ground work in mathematics." In fact, "Those interested in pursuing their mathematics studies still further, will find an excellent opportunity for doing so in the navigation schools of the U.S. Army Air Forces." A bombardier, however, only takes 27 weeks to train. His duty "is performed in a matter of seconds—but the most important seconds of the flight. At the crucial moment, when the bomber reaches its objective, the bombardier takes over from the pilot. Upon his skill in landing his bombs on the target depends the success of the entire mission." See Army Air Forces, Aviation Cadet Training 15-17.

<sup>187</sup> Mitchell 353.

The pre-World War II buildup and the war itself clearly demonstrated that the Air Corps/Forces/Force officer corps could not function effectively or efficiently without significant percentages of non-pilot officers. Achieving and maintaining 90% to 100% of the officer corps as pilots was unobtainable in a large organization prepared for war to break out at any time. In FY1948 pilots made up only 50% of the total Air Force officer corps. This percentage never increased beyond 50% in the independent Air Force. Instead, it decreased down to fewer than 20% of the total Air Force officer corps by FY2003. In FY1949, 90% of the Air Force general officers were pilots, although only 88% of them were still on flying status. In a sense, this illustrates that the Air Service/Corps drive for an almost all pilot officer corps as one of several concurrent strategies to achieve independence worked. However, this image did not fit the rest of the Air Force officer corps. The rapid expansion in size, new technology, the war, independence and the war-time footing required in the Cold War all demonstrated that Major General Patrick's claim that the Air Corps needed less than 10% of its officers to be non-pilots even during war was absurd.

#### Only Pilots can Command Flying Units

This pilot bias is at least partially explained by another aspect of the Air Service's/Corps officer corps' strategy to achieve professional independence after World War I. This strategy was to enshrine in national law that only pilots could command in the Air Service/Corps. Defining the command of flying units and the command of the Air Service/Corps/Forces itself as the domains of pilot officers



effectively freed the Air Service/Corps/Forces from an Army preoccupied with seniority that might be willing to place more senior non-flyers in command of both flying units and the Air Service/Corps/Forces itself. However, this action also effectively placed a glass ceiling over all non-pilots officers. Whether an observer/navigator, air battle manager, missilier, maintenance or communications officer, these officers were legally proscribed from the pinnacle of their profession, and practically prohibited from career progressions that approached the summit, i.e., positions of command in operations and operations support.

At the highest level, lies the issue of command over the entire air force organization, or the position that today is called the Chief of Staff of the Air Force. Although Congress had passed several pieces of legislation dealing with the Air Service, it was not until the 1926 act that Congress wrote into public law the requirement that the Chief of the Air Corps shall be a *flying officer*.<sup>188</sup> In addition, at least two of the three assistants to the Chief were also required to be *flying officers*, i.e.,

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<sup>188</sup> Public—No. 446—69<sup>th</sup> Congress, 1. During a Senate committee hearing on the bill, Major General Patrick, Chief of the Air Service, US Army, stated that without Senator Bingham's proposed amendment to require the Chief of the Air Service/Corps to be a flying officer, a supply officer without any flying experience could at that time theoretically become the Chief. The interchange between Senator Bingham and MG Patrick is revealing: "Senator Bingham. You do not think that the head of the Air Service ought ever to be a nonflying officer, any more than you would have a chief of the Cavalry a man who was afraid to ride a horse? General Patrick. I do not." See US Senate, The Army Air Service Hearing on H.R. 10827, 12. In addition to imputing that non-pilots were somehow afraid to ride in aircraft, Senator Bingham's choice of the cavalry for the analogy is quite strange, yet foretelling. In 1926, the Army still had a cavalry branch, and it was a much sought-after assignment, yet a totally anachronistic branch of service. "Cavalry" regiments continue in Army service, but without the requirement for horsemanship as the cavalry mount shifted to vehicles and later also helicopters. In tradition and belief, the Air Force officer corps has not abandoned the pilot requirement for the Chief of Staff position, although it is not a Title 10 requirement.



pilots. The emerging Air Service/Corps officer corps pushed for this restriction in order to prevent the Army officer corps, whose postings were seniority driven, from sending more senior colonels over from other branches like the cavalry or quartermaster corps to take over the senior Air Service/Corps billets.<sup>189</sup> Consequently, the 1926 act also carved out a seven-year period through 1 July 1933 that exempted the pool of candidates for the post of Chief of the Air Corps from being limited to colonels, which was the Army requirement. Instead, the Chief of the Air Corps could be drawn from more junior ranks. In addition, the 1926 act also reinforced the existing notion that the candidates for Chief of the Air Corps must “have demonstrated by actual and extended service in such corps that they are qualified for such appointment.”<sup>190</sup> Consequently, even a colonel of cavalry who had a pilot rating, but had only spent a year or two in the Air Service might be excluded from competing for the Chief of the Air Corps position. Instead, an Air Service/Corps officer pilot of any rank, perhaps a lieutenant colonel or major, but with as little as 15 years of active service, with most if not all of the service in the Air Service/Corps could be appointed Chief of the Air Corps and given the temporary rank (with pay and privileges) of major general. Such an officer was also an eligible candidate for one of the three brigadier general postings as assistants to the Chief.

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<sup>189</sup> The 1925 edition of the US Code specified that Army “vacancies in grades below that of brigadier general shall be filled by the promotion of officers in the order in which they stand on the promotion list, without regard to the branches in which they are commissioned.” See 10 USC 552, 1925.

<sup>190</sup> Public—No. 446—69<sup>th</sup> Congress, 4.

This antipathy towards the Army officer corps' seniority-based system, together with a preoccupation for youth and an emphasis on piloting were traits upon which the Air Service/Corps officer corps was founded. Major General Patrick was clear in his testimony with regard to the 1926 act's sections on increasing the number of Air Corps officers that the Air Corps did not want any sort of normal distribution of ranks in the officers to be transferred from the other Army branches. He would take all second lieutenants if he could get it that way. Officers above the rank of lieutenant brought baggage with them, had difficulty in pilot training, and would not be as hard working or as hard flying as young lieutenants.<sup>191</sup> The Air Service/Corps could never reach its potential in terms of mastering flying and flying combat operations if its mid-grade to senior leadership positions were filled through the process of a revolving door for old, non-flying officers. Furthermore, the Air Service/Corps officer corps could not create its own sense of professional corporateness unless it had a closed membership with entry primarily through one path—pilot training. Whether by statute or tradition, it is inconceivable that the Chief of Staff of the Air Force could be a non-pilot.

The requirement for non-pilot (observer) rated officers was very limited, given the aircraft of the time. However, as the Air Corps continued to build, it opened the exciting theoretical possibility that an observer in a strategic bomb unit could command the unit in time of war. Of course, the day the theoretical war ended, the observer would have to relinquish command. In 1940 Congress eliminated the distinction

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<sup>191</sup> US Senate, The Army Air Service Hearing on H.R. 10827, pp. 27, 7.



between wartime and peacetime definitions of *flying officers*. In fact, the definition of *flying officer* became quite liberal: “A flying officer is defined as one who has received an aeronautical rating as a pilot of service types of aircraft or one who has received an aeronautical rating as an aircraft observer or as any other member of a combat crew.”<sup>192</sup> Observers, navigators, bombardiers, and other officers serving in crew positions were now classified as *flying officers* even in peacetime. In fact, in 1942, flight surgeons, as well as commissioned and warrant officers in flight training were also classified as *flying officers* for the duration of the war plus six months.<sup>193</sup> However, this liberalization was meaningless since the 1940 act closed the old wartime exception—now only pilots with heavier-than-air ratings could command flying units. However, with war on the horizon, these pilots could now come from the larger Army and were no longer specifically restricted to the Air Corps officer corps.<sup>194</sup>

The initial World War II Army Air Forces implementation was even more restrictive. The August 1942 Army regulation stated, no officer but a pilot “Will command tactical units of the Army Air Forces, posts, camps, stations, depots, schools, and other commands, the primary functions of which are so connected with flying operations as to call for a comprehensive knowledge of flying on the part of the

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<sup>192</sup> National Defense Act Amendment, Pub. L. 76-795, 76<sup>th</sup> Cong. Ch 742, 4 Oct 1940, Stat. 54-963. Army Air Forces, Army Regulations No. 95-60, “Aeronautical Ratings; Flying Officers; Command of Flying Units” (Washington: War Department) 20 Aug 1942 [cites the 4 Oct 1940 Act, Stat. 54-963], p. 2.

<sup>193</sup> Army Regulation 95-60, 20 Aug 1942, [cites Act July 2, 1942; Bull. 30, War Dept., 1942], pg. 2.

<sup>194</sup> “Flying units shall in all cases be commanded by flying officers who have received aeronautical ratings as pilots of service types of aircraft and who are commissioned in the Air Corps, or qualified permanent general officers of the line who have received aeronautical ratings as pilots of service types of aircraft.” See Pub. L. 76-795; and Army Regulation 95-60, 20 Aug 1942, p. 2.



commander.”<sup>195</sup> However, since every air base with a flying strip or navigational aid was conceivably so connected to flying that it required a pilot, the wartime Air Forces could not hope to fill all of these billets with pilots. Consequently, in 1943 the Army Air Forces tightened the definition of flying units to units with actual aircraft assigned or units that could issue flying orders.<sup>196</sup> This articulation limited the number of units requiring pilot commanders.

On a practical level, the ramifications of a policy that only pilots can command flying units was immense. From the top down, all major commands, numbered air forces, and units down to the squadron level were authorized to issue flight orders, even those without direct flying tasks such as Technical Training Command. From the bottom up, as squadrons were amalgamated into groups, groups into wings, wings into air divisions and/or into numbered air forces, non-flying units were quickly subsumed under the wings of a flying organization. Functional units performing tasks like maintenance, supply, air traffic control, tactical air control, or security police were

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<sup>195</sup> Army Regulation 95-60, 20 Aug 1942, p. 2.

<sup>196</sup> “All units or activities having aircraft organically assigned thereto or having authority to issue flying operations orders will be commanded only by flying officers on duty with the Army Air Forces who have received an aeronautical rating as Command Pilot, Senior Pilot, Pilot, Senior Balloon Pilot, or Balloon Pilot.” See Headquarters Army Air Forces, AAF Regulation No. 55-1, “Operations, Flying Units – Command,” (Washington: War Department, 4 Aug 1943). The regulation also continued existing exceptions for senior service pilots, service pilots and glider pilots, who of course were still pilots, to command specific flying units. Service pilots, who had a lower-level rating in terms of aircraft horsepower and hours required, were permitted to command air transport, liaison aircraft and glider units. Glider pilots were restricted to commanding units that only contained glider aircraft. The exceptions for senior service pilots, service pilots and glider pilots are interesting from the point of view that the regulation does not impose similar restrictions on senior balloon pilots and balloon pilots. Theoretically, an old balloon pilot could command bombers units of any size, whereas a senior service pilot, who had heavier-than-air flying time in the thousands of hours, could not. Of course, there were more senior service pilots and service pilots than the odd few senior balloon and balloon pilots. Nevertheless, in all cases, the prerequisite for command of flying units was still the possession of a pilot rating.

technically open to command by non-rated officers serving in these career fields up to the squadron or even group organizational level. However, they soon hit the ceiling limiting advancement. Sooner or later they would be amalgamated into a group, wing or higher command that owned aircraft and/or was authorized to issue flight orders. From that point and upwards, only a pilot could be in command. Furthermore, since flying units could only be commanded by a pilot, all key positions in that particular level of unit were reserved for pilots so that they could be prepared for command. Non-pilot officers were explicitly prohibited from operational commands and implicitly forbidden to command pilot officers. This policy, which the senior officer leadership of the Air Service/Corps initially pushed into law and long after maintained as the natural order of things, restricted the profession's ability to make use of potentially good leaders, while concurrently limiting the upward mobility of non-pilot officers and creating a two-class system of pilots and non-pilots.

#### Navigators Are Permitted to Command Flying Units

The Air Force officer corps has not been completely blind to the implications of a policy that only pilots can command flying units. For example, in March of 1949, Major General Laurence Kuter, the commander of Military Air Transport Service (MATS), requested that General Vandenberg, the Air Force Chief of Staff, grant him authority to appoint non-pilot officers to command positions in MATS. Major General Kuter placed caveats in his request, e.g., that he would not put non-pilots in charge of units with wartime missions, and he even briefly described the analogy between MATS



and civilian airlines, which did not rely entirely on pilots for management. Furthermore, General Kuter stated that his non-pilot commanders would obviously use pilots for advice where and when needed. The request was denied, and a staff study supporting the denial indicated that non-pilots already had enough command opportunities since they were theoretically eligible for consideration for 71% of all Air Force command billets. Furthermore 85% of field grade billets could theoretically be held by non-pilots. The study did not make a distinction between *other rated* (navigators) and non-rated officers. They were for all intents and purposes the same, and only pilots should command flying units.<sup>197</sup> Of course, pilots were eligible for 100% of the line command billets and only they could command the flying and operational billets—the heart of the profession. In addition, pilots could compete for 100% of the field grade line billets and they continued to dominate. In 1953, pilots occupied about 2,400 command and directorate positions, while *other rated* (navigators) officers only held 15.<sup>198</sup>

MATS and Air Training Command later requested that the Air Staff take another look at the possibility of using *other rated* officers in command positions. An Air Staff study in 1953 outlined the problem, but did not result in *other rated* officers being allowed to command flying units. However, in October 1953, units which did not have flying as a primary function, but only as a collateral or support function, were

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<sup>197</sup> Mitchell 345-346.

<sup>198</sup> Mitchell 347-348.



opened to non-pilots, with a preference given to *other rated* over non-rated officers. If a non-pilot was selected though, his operations officer deputy was required to be a pilot. In the case of ground-launched missiles, command was not opened to non-pilots until 1956. *Other rated* were not given any priority over non-rated officers for missiles, presumably because they had no tangential experience with ground-launch missiles and, of course, they presumably lacked the pilots' inherent leadership skills. Nevertheless, pilots were still listed as the desired experience for command of ground-launched missile units until 1960.<sup>199</sup> Consequently, *other-rated* appeared to be the equivalent of *non-rated*, which in turn meant non-pilot, or perhaps simply lacking in leadership.

Consequently, from 1926 through 1940, *observers, navigators* or *other-rated* officers were not considered *flying officers* within the Air Corps/Forces/Force. The requirement for commanders of Air Corps/Forces/Force flying units to be pilots started in 1926 and continued throughout World War II, Korea, and Vietnam. Then, amid the post-Vietnam drawdown and tremendous social upheaval within the services, the Air Force officer leadership went back to Congress in 1974 and presented a draft act "to amend title 10, United States Code, by repealing the requirement that only certain officers with aeronautical ratings may command flying units of the Air Force."<sup>200</sup> The Air Force asked Congress to strike all requirements for command of flying units.<sup>201</sup> Statutorily, from December 1974 on, any Air Force officer could command Air Force

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<sup>199</sup> Mitchell 347-348.

<sup>200</sup> Command of Flying Units, Pub. L 93-525, 18 Dec 1974, Stat 88-3906.

<sup>201</sup> The act itself amends the code "by repealing section 8577 (relating to the command of flying units of the Air Force) and by striking out the corresponding item in the analysis of chapter 845." Pub. L 93-525.

flying units. While the bill was making its way through Congress, a “high-ranking Headquarters official” acknowledged to an Air Force Times reporter that non-rated officers, including women, could become commanders of flying units with passage of the act, but maintained that “for the time being, the possibility will remain theoretical.”<sup>202</sup> The Air Force officially maintained that it was only asking for the change in order to allow navigators to command flying units. However, instead of proposing an act broadening the restriction from specifically *pilots* to the broader term of *rated officers*, or perhaps to *rated line officers* in order to exclude flight surgeons, the Air Force simply proposed abolishing all caveats to command of flying units. The confusion between the terms *rated*, *other-rated*, *non-rated*, and where exactly *observers*, *navigators*, and *flight surgeons* fell, complicated discussions of the bill and clouded the Air Force’s implementation of the law.<sup>203</sup>

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<sup>202</sup> “Navigators Near Command Role,” Air Force Times 25 Sep 1974: 4.

<sup>203</sup> In fact, the confusion over who exactly would be allowed to become commanders of flying units under the act became an issue of debate among some congressmen. This delayed passage of what the Air Force had ostensibly considered a non-contentious bill. Although the bill was quickly passed by the Senate, it ran into some opposition in the House Armed Service Committee. During discussions on the bill, Representative Bill Nichols (D-Ala), who was the sole dissenting vote in the subcommittee, stated, “If I were an infantry lieutenant, I would want the company to be commanded by an infantry officer rather than a quartermaster.” Representative Samuel Stratton (D-NY), Chairman of the House Armed Services Subcommittee that initially passed the bill, reported that the purpose of the bill was to “improve the morale of the navs, and make them think they aren’t second class citizens.” Representative Otis Pike (D-NY) initially opposed the bill: “I just don’t like the idea of non-pilots commanding flying units....By removing the restriction, aren’t we saying that anybody who has any kind of aviation rating can command an aviation squadron?” When Representative Stratton mentioned further that the Navy had removed similar barriers to non-pilot command over naval aviation units, Representative Pike retorted that “the way to attack the problem would be to remove that right from the Navy rather than give it to the Air Force.” See George Foster, “Foes Slow Command Navigator Bill,” Air Force Times 16 Oct 1974: 3. However, only one representative voted against the measure in the full House vote. Representative H.R. Gross (R-Iowa) was concerned that simply repealing the paragraph would open up command of Air Force flying units to non-flying officers. Representative Stratton once again represented the Air Force position



The Air Force officer corps also ignored that the fact that it and its predecessors were responsible for the law restricting command of flying units to pilots. Furthermore, the Air Force stuck by its contention that the purpose behind the entire exercise of changing the law was to provide equal career opportunities to navigators. Since navigators had long complained about the discrimination, the Air Force thought that allowing navigators to compete for flying commands would motivate navigators to stay onboard and seek careers in the Air Force. However, the Air Force was also quick to point out that the new law would not instantly translate into navigator commanders of flying units. Instead, the Air Force stressed that it would be an “evolutionary” process. First, commander billets that navigators could fill had to open up. Second, qualified navigators would have to be found that could compete against pilots for the billets.<sup>204</sup> It was also clear that navigators would only be permitted to command in units flying aircraft with navigator positions, although there was no statutory basis for this restriction. Navigator command over single-seat fighter units was automatically excluded, just as the Air Force was on the verge of starting to shift its primary front-line fighter from the two-seat (one pilot; one weapons system operator/“navigator”) F-4 to

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that only navigators, and not non-rated officers, would be used for command of flying units. Furthermore, Representative Stratton urged his colleagues to support the bill: “If we do not have enough confidence in our top officers in the Air Force to allow them to make the selection of commanders for subordinate units, then we are going to be in for real trouble. We ought to leave that kind of decision up to them.” See “Legislative Actions: Nav-Command Bill Passes House,” *Air Force Times* 25 Dec 1974: 2. The logic of Representative Stratton’s argument ran counter to the fact that it was the Air Service/Corps/Forces that pushed for the restrictions in the first place, limiting command of flying units first to flying officers in 1920, and then to only pilots from 1926 onwards.

<sup>204</sup> “Navigators in Command: Long Road Ahead,” *Air Force Times* 29 Jan 75: 5.



the single-seat F-15. Consequently, navigators would be limited largely to command of big plane units flying cargo, bomber and some C4ISR aircraft. Since the Air Force had already oriented itself away from its earlier emphasis on strategic offense and defense to tactical operations, navigators would be competing with pilots for command over less prestigious flying units. Furthermore, since all jobs that were seen as being building blocks towards command had been reserved for pilots for generations, some Air Force officials implied that it could be a long time before a navigator could actually take command of a flying unit.<sup>205</sup> Field grade navigators had already missed the required steps in flying units. There was talk about some sort of training for command positions, but pilots of course did not require or receive such training. Consequently, the long-term emphasis would be on growing brand new navigators who could compete and win intermediate positions such as flight commander and operations officer slots along the way to command. This process, however, would take 15 to 20 years.

That notwithstanding, the Air Force announced its ice-breaking navigator commander in February 1975 when Colonel (Brigadier General-select) Eugene D. Scott was named commander of the 47<sup>th</sup> Air Division at Fairchild AFB, Washington. The 47<sup>th</sup> Air Division commanded a B-52 wing at Fairchild AFB as well as a missile wing at Malmstrom AFB, Montana. Colonel Scott had never served in the B-52, but the assignment made sense from the perspective that he was arguably better defined as a missilier with navigator experience. Although he had served as a navigator from 1950

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<sup>205</sup> "Navigators Near Command Role," Air Force Times 25 Sep 1974: 4.

through roughly 1962, his career from 1963 through 1975 was largely in missiles. In fact, he was commander of a missile wing when selected for command of the air division.<sup>206</sup> Such a career was not atypical for navigators who reached more senior ranks because they could realistically only achieve higher rank outside the flying world. Although second-class citizens in the flying world, second-class wings often trumped no wings in the non-rated world. After all, the Air Force was still about flying. By September 1975, roughly a year after the Air Force first introduced the bill allowing non-pilot officers to command flying units, the Air Force reported that navigators commanded “three operational flying units and seven flight training squadrons” out of the Air Force’s 350 total flying units.<sup>207</sup> The other 340 flying units were still under pilot command.

Several factors were at work in shaping the Air Force officer corps’ leadership’s decision to go to Congress and repeal the requirement that only pilots can command flying units. One factor was the general tendency in the Air Force and society at large to recognize existing discrimination and to attempt to redress it. The discussions on the issue of navigator command frequently painted the picture using words like *discrimination* and *second-class status*, and the discrimination was obvious. For example, from the Air Force’s birth into the 1960s, pilots in some units wrote the performance reports on higher ranking navigators that happened to be in their crew. In

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<sup>206</sup> “Navigator to Head Combat Flying Unit,” Air Force Times 12 Feb 1975: 2.

<sup>207</sup> “10 Navs Head Flight Units,” Air Force Times 10 Sep 1975: 24.

this case, rank meant nothing in the air, and also nothing on the ground. The function of pilot overrode all other hierarchies. In addition, it was not unheard of to have “pilot-only” rooms in base operations facilities. Furthermore, there was a major lag between the Air Corps/Forces implementation of wings showing the bearer’s rating and seniority for pilots versus those for navigators. The independent Air Force continued its predecessors’ tradition of three levels of pilot ratings. The first level was the basic pilot wings. The second level, *senior* pilot, was represented by a star centered at the top of the pilot wings. The highest level, *command* pilot, was indicated by a wreath around the star centered at the top of the pilot wings. The Air Force did not permit the senior observer/navigator rating and wings until 1953, matching the long-standing senior pilot rating with a requirement for seven years of flying and 2000 flight hours. However, the issue of the navigator equivalent to the *command* pilot with 15 years of flying and 3000 flight hours was not resolved until 1959 with the determination to call such navigators *master* navigators. After all, only pilots could be associated with *command*.<sup>208</sup> Prior to 1974, navigators, who stayed in flying units, by choice or under compulsion, were on a dead-end track. No matter how experienced and competent they were as navigators, they could not command. Since they could not command, they were not given promotable jobs. Since they did not serve in promotable positions, they did not get promoted. However, if they left flying units, they could get commands and positions of responsibility in the non-flying world.

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<sup>208</sup> Mitchell 349.



Chart 7-2 (Air Force Navigator, Black, Female, Other (Minority) General Officers) shows that after the wave of senior World War II navigators pushed through the Air Force's general officer ranks in the early to mid-1950s, the number of general officers who were navigators on flying status dropped to zero until 1965. Then, as the war in Vietnam, protests against the war, and civil rights protests increased, the Air Force officer corps increased the numbers of its navigator, black, female, and other minority general officers. There appears to be some correlation between the rise and fall between roughly 1970 and 1990 of the total number of general officers who were navigators, black, female or other minority, and a similar correlation of a second wave of growth in all categories but "other" from roughly 1990 to the end of the chart in FY2003. Consequently, a general social awakening may have played a role in the Air Force officer corps' decision to let navigators compete for command of flying units.

However, a variety of other factors are also involved in the navigator case. First, overall navigator manning levels played a role. Chart 7-3 (Percent per Rank are "Navs" on Flying Status) shows two clear successive waves of Air Force navigator intakes that progressed through the ranks like an animal through a snake. The first wave began with a big influx of navigators in the lieutenant ranks between FY1953 and FY1961. The percentage of Air Force lieutenants who were navigators on flying status climbs, peaked in FY1961 at 22%. As the lieutenants were promoted to captain, the percentage of captains who were navigators on flying status continued to climb until it peaked in FY1966 at 21%. As the captains in turn were promoted to major, the

**Chart 7-2: Air Force Navigator, Black, Female, and Other (Minority) General Officers**

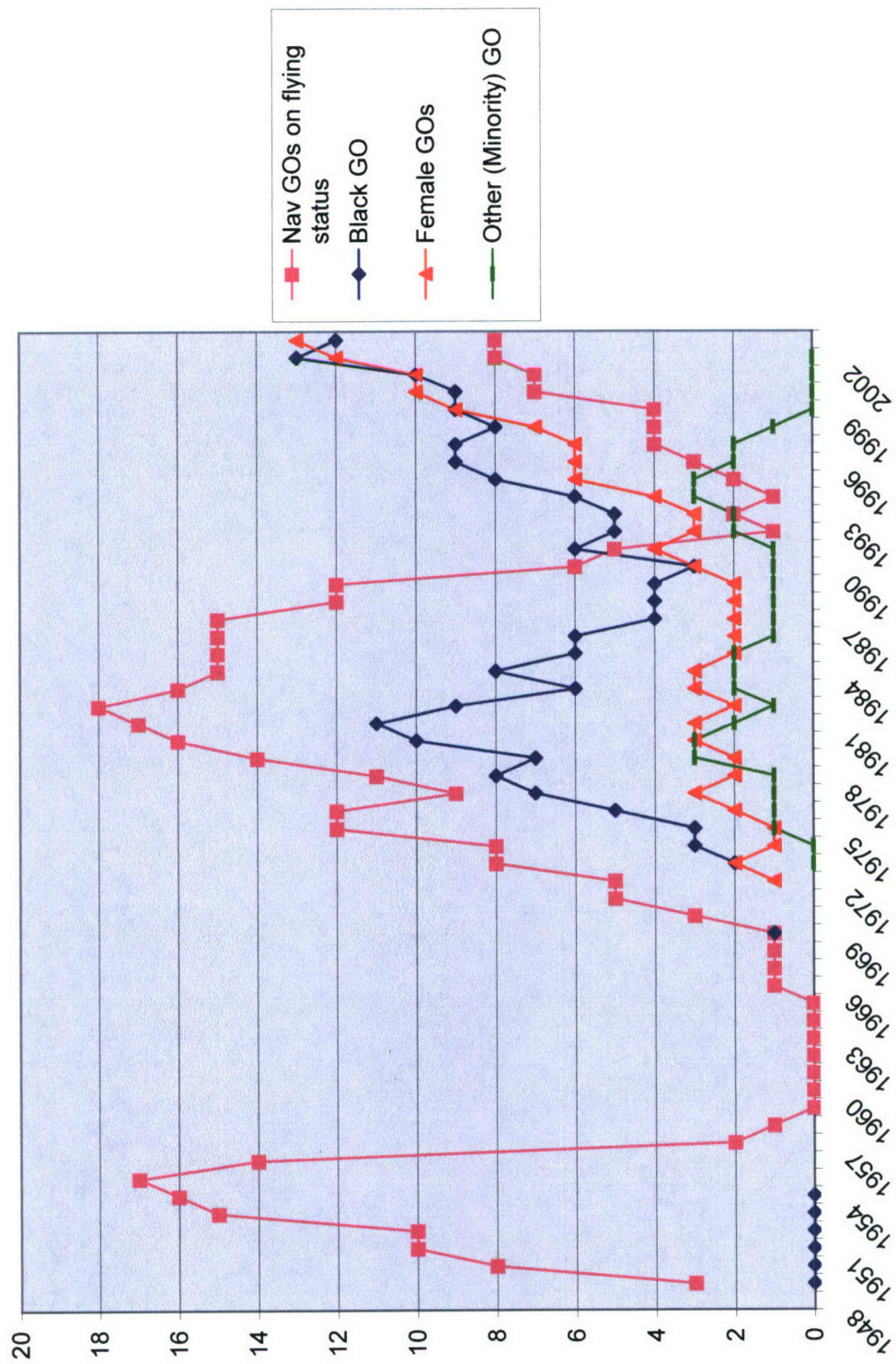
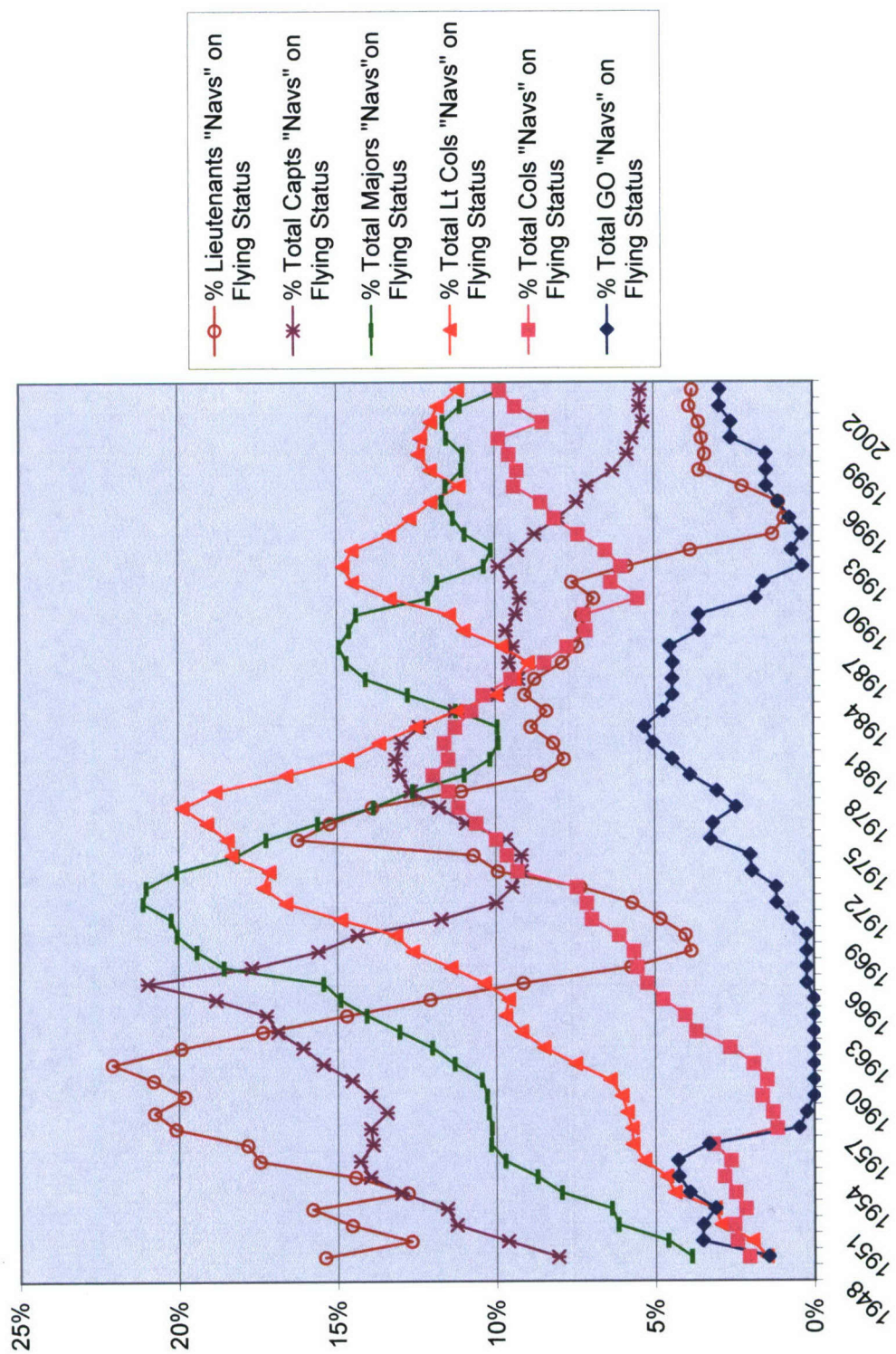




Chart 7-3: Percent per Rank are "Navs" on Flying Status





percentage of majors who were navigators on flying status continued to climb until it peaked in FY1971/FY1972 at 21%. The same held true for lieutenant colonels, the percentage of whom were on flying status peaked in FY1977 at 20%. Fewer lieutenant colonels were promoted to colonel, and the percentage of colonels who were navigators on flying status peaked in FY1979, but only at 12%. The general officer navigators on flying status completed the first wave, peaking in FY1982 at just 5% of the total general officers. Concurrently, the second wave, the Vietnam buildup, started with lieutenants in FY1968 when navigators on flying status made up only 4% of the total lieutenants. The percentage of lieutenants who were navigators on flying status for the Vietnam wave peaked in FY1975 when they made up 16% of lieutenants. The Vietnam wave played through the rest of the chart, but the end of the Cold War distorted it and created a new pattern. What is particularly important to note is that in FY1975, when the Air Force brought the draft act to Congress and the bill became law, the percentages of generals, colonels, lieutenant colonels, and captains who were navigators on flying status were still climbing. The percentage of lieutenants who were navigators on flying status peaked in FY1975. This general flood of navigators across the ranks potentially created a general atmosphere of increased tolerance for navigators and support for navigator issues within the officer corps. After all, the navigators were being promoted at consistent rates through lieutenant colonel by promotion boards consisting of Air Force colonels. Although navigators were being promoted at much lower rates to

colonel and general officer, the percentages of navigators per grades were still climbing in FY1975 and at an all time high for colonels.<sup>209</sup>

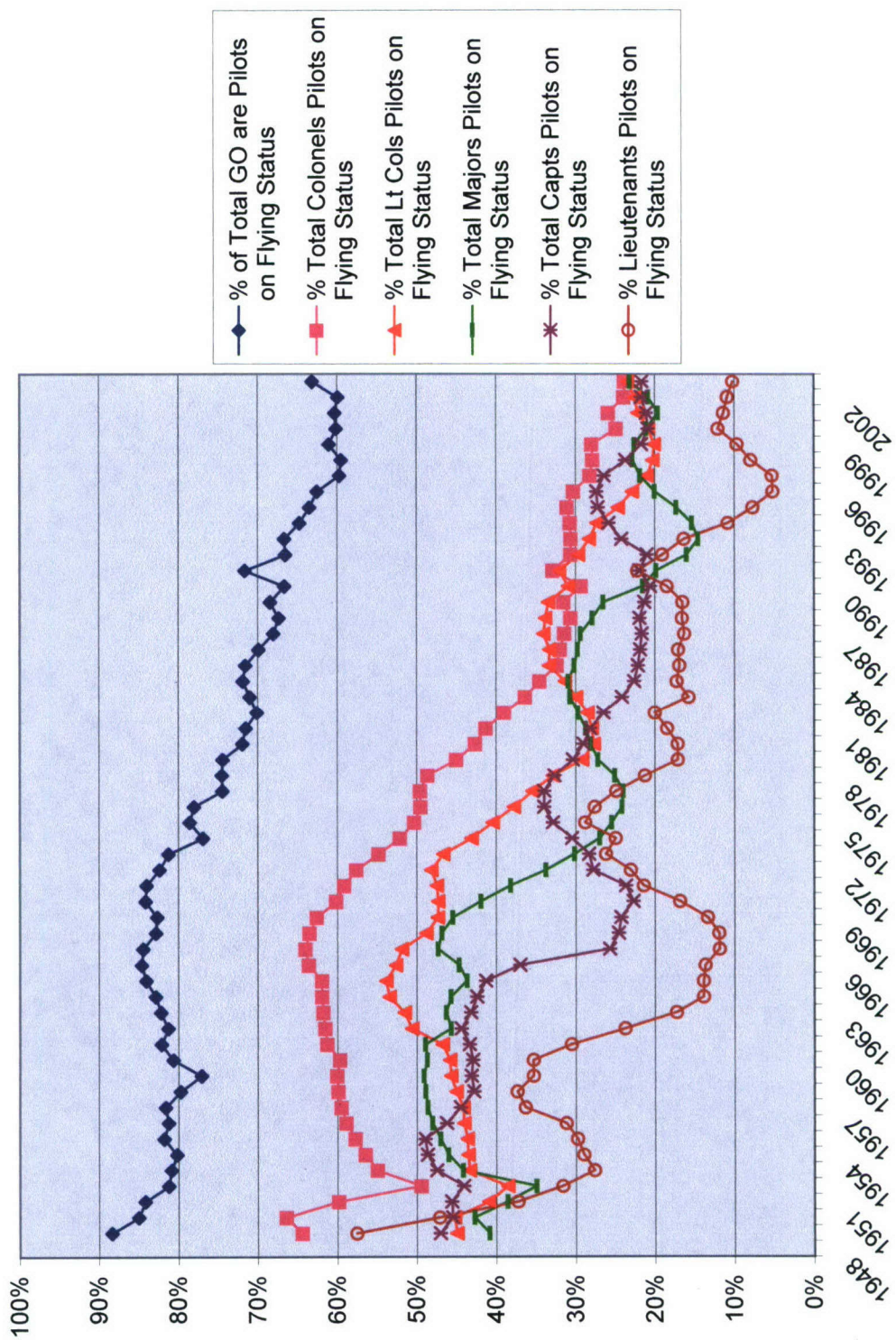
Another reason for the Air Force officer corps support for the law allowing navigators to command flying units was that quite simply, the Air Force needed navigators and the assorted specialties captured under the term *navigator*. Navigators proved indispensable in the Vietnam conflict. The new technology for waging war required navigators. For example, the F-4 became the Air Force's top fighter in terms of both quantity and quality during the war. The Air Force initially manned both crew positions with pilots, but changed to a pilot in front and a navigator-based weapons system operator (WSO) in back by 1968. Although the back seat had full flight controls, the back-seater was required to work the radar system for both air-to-air weapons and bombing. The initial F-4 models did not have an internal gun; air-to-air missiles were the primary weapon for shooting down enemy aircraft. The semi-active radar missiles required the radar to operate, and the infrared missiles could be more effectively employed when fired in conjunction with radar-provided range and other data. Pilots preferred to fly the aircraft and were not keen on performing the radar management tasks. In addition, WSOs were cheaper to train and took less time to qualify for combat. Therefore, the Air Force went to the WSO in the back seat.

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<sup>209</sup> However, a comparison of the "wave chart" (Chart 7-3) for navigators with the similar chart for pilots, Chart 7-4 (Percent per Rank are Pilots on Flying Status), illustrates the general discrimination against navigators. Whereas the percentage of navigators on flying status generally decreases as rank increases, the trend for pilots is generally the opposite. Navigators and non-rated officers are gradually distilled out as they progress through the ranks. This is especially consistent for general officers, but also for other ranks, at least through the mid-1980s.



Chart 7-4: Percent per Rank are Pilots on Flying Status





Consequently, the Air Force's front-line fighter from the mid-to-late 1960s through the early 1980s required equal numbers of pilots and WSOs to operate. Furthermore, they had to function as a team in order to get ordnance on targets, whether in the air-to-air or air-to-ground arenas.

In recognition of this fact, when the Air Force set the rules for determining air-to-air "kills" in Vietnam, it decided to give a kill credit to both crewmembers in the F-4 for downing an enemy plane. This decision was made in 1966 when both crewmen were still pilots, but the Air Force did not change the policy when it changed F-4 manning to WSOs.<sup>210</sup> After all, the radar system was critical to the plane's operation. F-4 pilot Captain Steve Ritchie began his description of his fifth kill, which made him an ace, as follows: "After Chuck [the WSO] picked them up on radar, we made a hard turn to meet them head on. The 'bandits' were very high, approximately 4,000 feet above us as we climbed. I turned as hard as I could and I squeezed off two missiles."<sup>211</sup> The WSO saw the "bandits" on the radar scope before the pilot saw them visually. The WSO locked on to the enemy aircraft so that the pilot could fire the air-to-air missiles. To be effective, the F-4 required equal participation by the WSO. By the Vietnam War's end, the leading Air Force ace, with six kills, was a WSO, and two of the Air

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<sup>210</sup> See for example, "New 'Kill' Policy Set For Pilots," Air Force Times 30 Nov 1966: 15. "No Credit Given 'Kills' on Ground," Air Force Times, 4 Jan 1967: 11. John Allen, "Stake Your Claim: Shavetail Commands F-4," Air Force Times 11 Sep 1968: 11.

<sup>211</sup> Ritchie and "Chuck" DeBellevue were alerted to the "bandit's" general location by the command and control system. The first two missiles missed, as did a third, but the fourth hit the Mig. See Secretary of the Air Force, Officer of Information, "First Air Force Ace in Southeast Asia," Air Force Fact Sheet 73-7, AF Aces/ 1918-1972 (Washington: Secretary of the Air Force, May 1973) 19. A head-on attack required the use of semi-active radar guided missiles and constant WSO involvement.

Force's three total aces were WSOs. WSOs were not just indispensable; they were the Air Force's heroes.<sup>212</sup>

Although not as lionized, navigator electronic warfare operators (EWOs) played critical roles in fighter Wild Weasel aircraft battling SAMs as well as in B-52s. In the B-52, three of the five officer crewmembers were navigators (navigator, bombardier, EWO), and no one would go home if the B-52 EWO could not electronically divert the SA-2 "flying telephone poles" streaking towards the bomber. The new technology of warfare required navigators, and the wartime experience emphasized in a personal way to pilots how much they were dependent on navigators to not only complete the mission, but to simply survive. Navigators indeed demonstrated that they too can have the right stuff, and this in turn, broke down some of the barriers to non-pilot command of flying units.

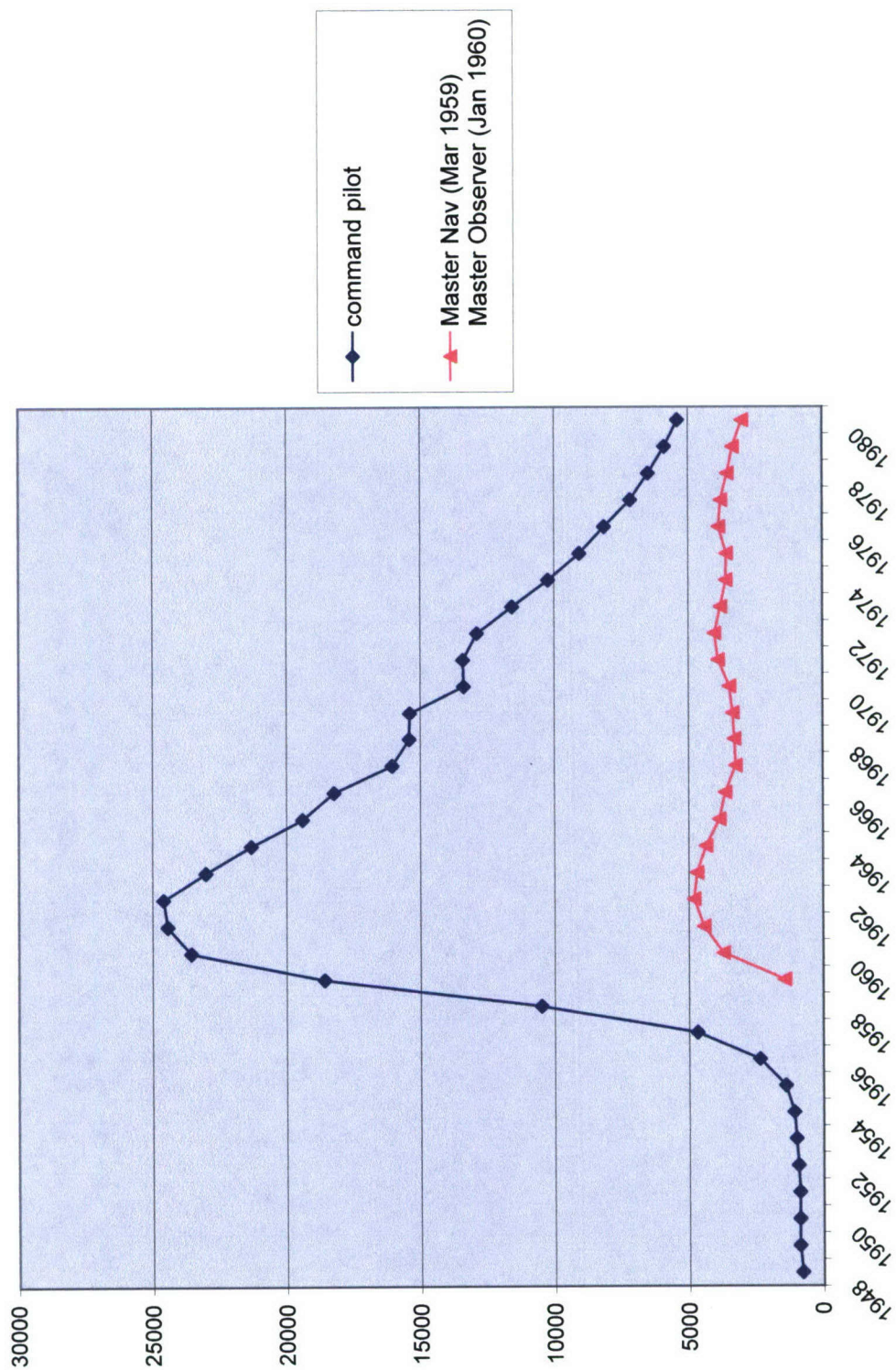
In addition to their importance in aircrews of modern combat aircraft, navigators also provided a more steady level of flying experience in the officer corps. Whereas the total number of pilots with the most experienced *command pilot* rating began a steady decline in FY1962, the number of *master navigators* remained more level. See Chart 7-5 (Pilots and Navs with Command Pilot or Master Navigator Rating (1948-1980)). When examined in terms of percentage of pilots and percentage of navigators, the

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<sup>212</sup> As General Thomas White, Air Force Chief of Staff told the American Fighter Aces Association at their inaugural gathering in 1960, "As a young boy dreaming of becoming an airman—if I had a choice between becoming chief of staff of the Air Force or becoming a fighter Ace, I would have chosen to become a fighter Ace." Secretary of the Air Force, Officer of Information, "Tribute to an Ace," Air Force Fact Sheet 73-7, AF Aces/ 1918-1972 (Washington: Secretary of the Air Force, May 1973) 20.



Chart 7-5: Pilots and Navigators with Command Pilot or Master Navigator Rating (1948-1980)





percentage of navigators with *master navigator* ratings first exceeded the percentage of pilots with *command pilot* ratings in FY1976. See Chart 7-6 (% of Total Pilots and Navigators with Command Pilot or Master Navigator Ratings (1948-1980)). Navigators made a flatter curve with respect to the percentage of navigators who stayed until retirement in comparison to the percentage of pilots or percentage of non-rated officers staying until retirement. See Chart 7-7 (Comparison of Retirement-Eligible Losses for Pilots, Navigators and Non-Rated Officers (1953-1980)).<sup>213</sup> By the 1960s, navigators did not possess a job skill in demand in private industry, but pilots and many non-rated officers did. Consequently, the steady experience of the navigator pool potentially offset the large increase in inexperienced pilots caused by the Vietnam buildup. See Chart 7-8 (Pilots per Pilot Rating (1948-1980)). This also bode well for an upping of the general status of navigators in the mid-1970s.

Finally, the Air Force officer corps might have consciously tried to buy navigators in before it lost them. In 1974, the Air Force was on the verge of a dramatic change in regulations on flying status and flight pay. In order to cut costs, the Air Force and other services were being forced to give up the old system of flying four hours a month in practically any aircraft to maintain flight currency and pay. This system

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<sup>213</sup> Retirement-Eligible Losses means officers who appear to have reached their potential retirement age and left the Air Force through retirement, separation (without retirement benefits), or death. I selected 39 years of age and older as the cutoff since 20 years of service is the minimum for retirement, and an aviation cadet with one year or less of college would reach that point at age 39. Consequently, 39 would be the earliest possible beginning of the retirement window for most officers, with the majority hitting retirement eligibility by the age of 42. There are huge economic disincentives to leaving the Air Force short of 20 years of active duty service, so by the age of 39 most stay in at least until qualifying for a pension.

Chart 7-6: Percentage of Total Pilots and Navigators with Command Pilot or Master Navigator Ratings (1948-1980)

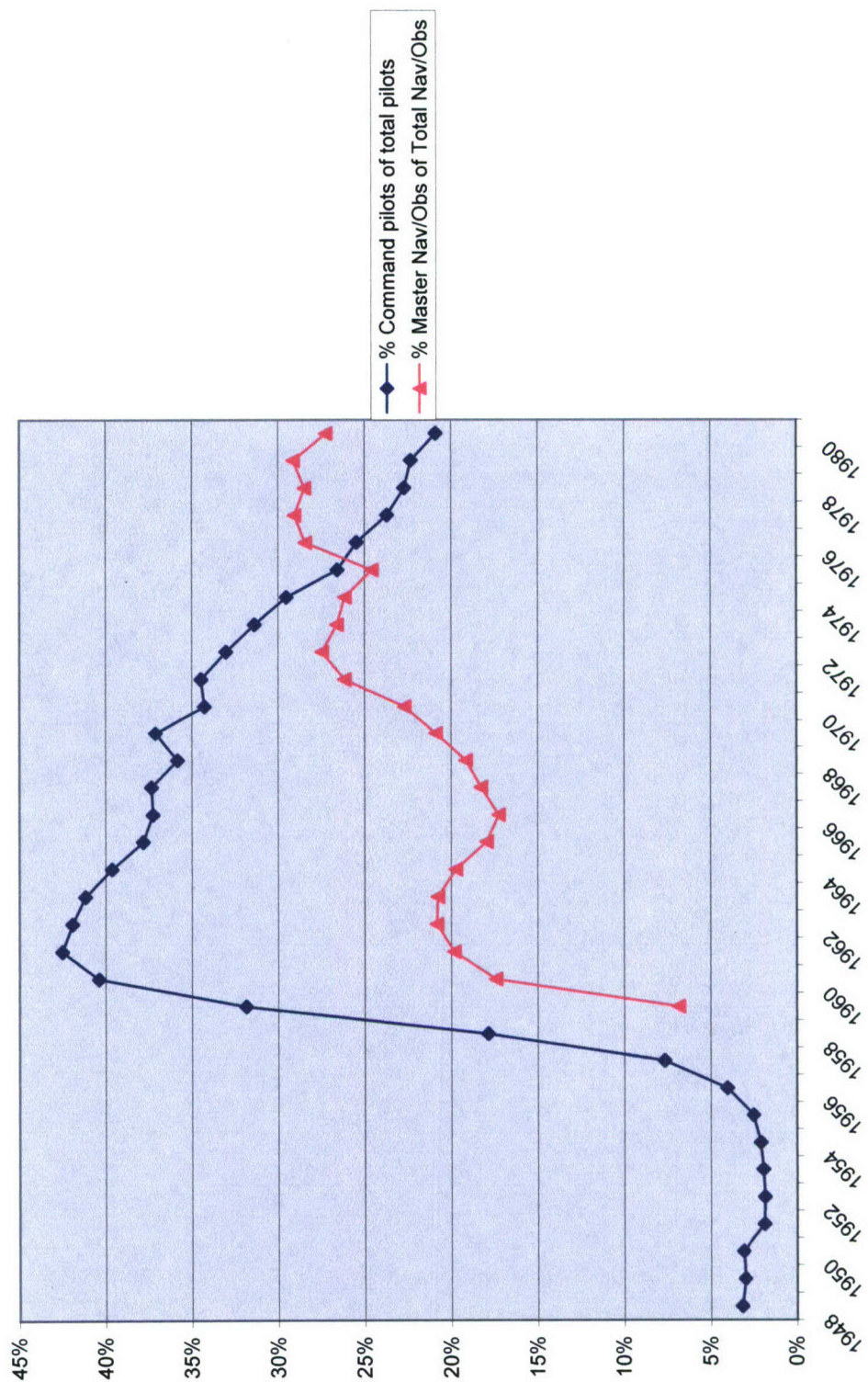




Chart 7-7: Comparison of Retirement-Eligible Losses for Pilots, Navigators and Non-Rated Officers (1953-1980)

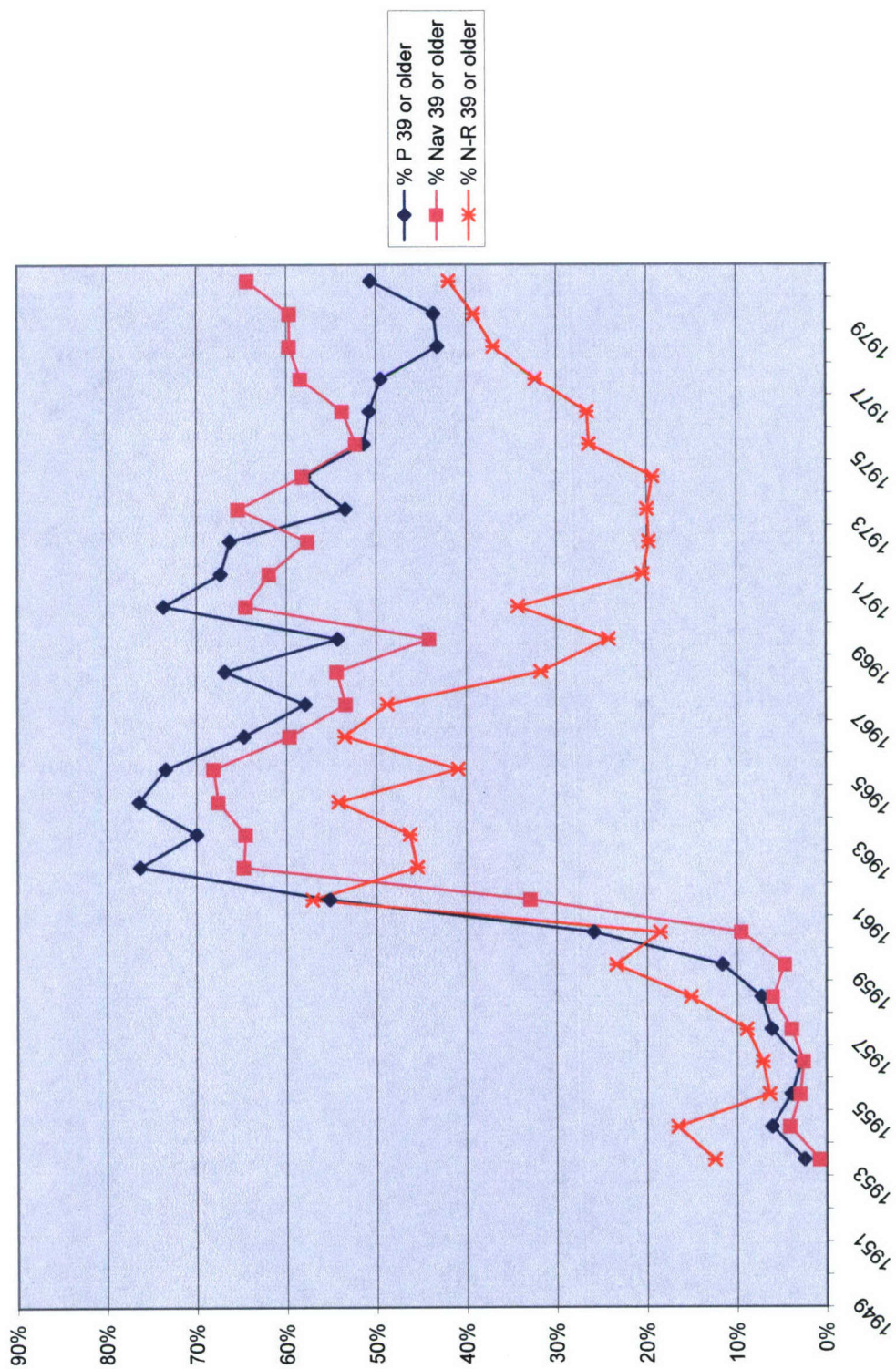
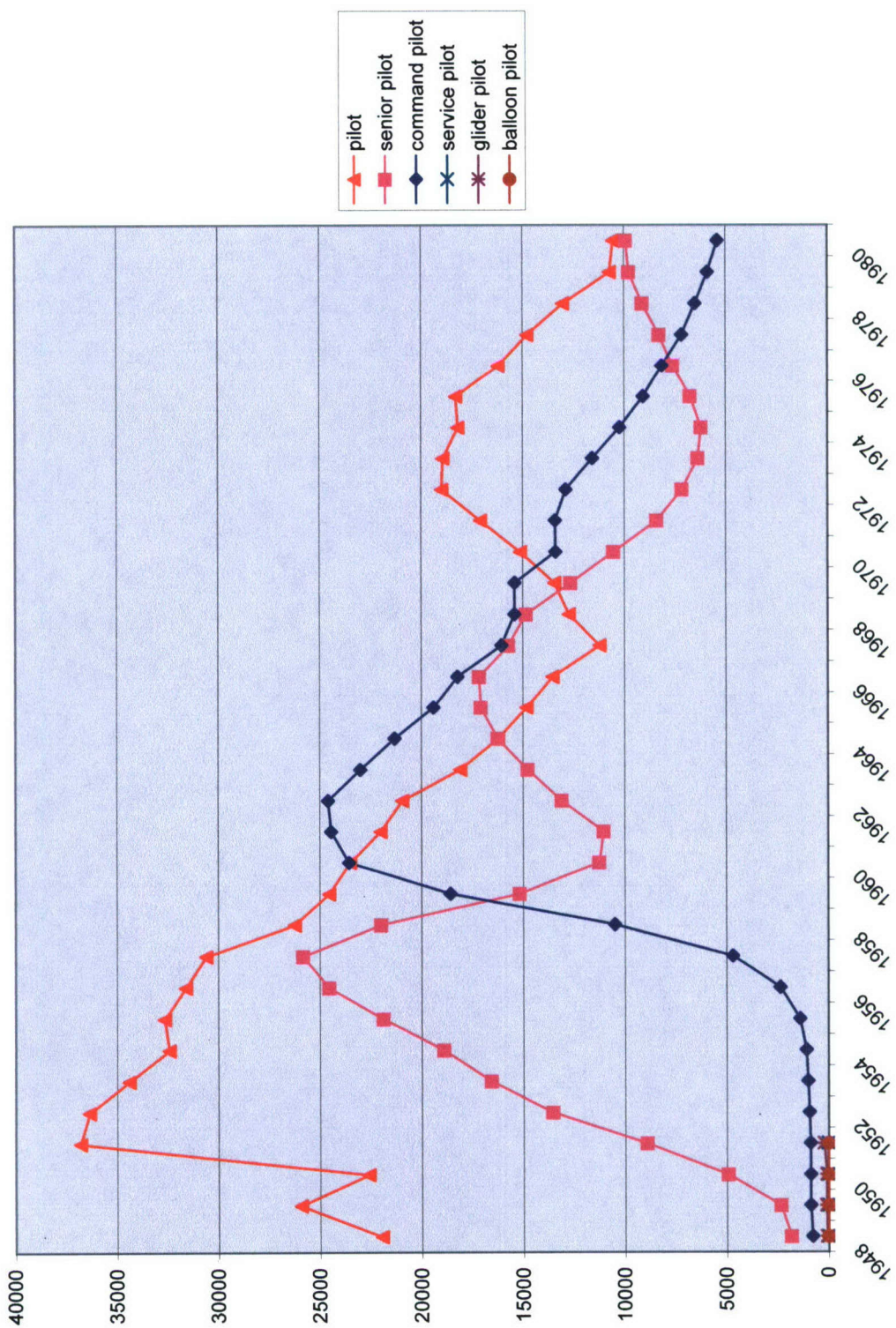




Chart 7-8: Pilots per Pilot Rating (1948-1980)



required the Air Force to keep some number of relatively simple aircraft at practically every base; so that primarily pilots, and occasionally navigators working staff jobs or attending service schools could hop in and log their hours. There were no pretenses about maintaining combat proficiency. Practically any airplane would do, although navigators had to find a plane with a navigator position. The upcoming change was going to scrap the proficiency system and move to a system of gates. Pilots and navigators would only fly when in a flying billet, i.e., when part of a flying unit. The Air Force would no longer maintain airplanes all over just for rated officers to log their required minimum currency hours. However, as long as a rated crewmember was with a flying unit and flew enough years before hitting each gate, he would be paid for a specific number of years, regardless of whether he flew or not during that time period. Meeting the flying requirements at all three gates would ensure flight pay through normal retirement. However, meeting the flying requirement for each gate would also mean a lot more flying assignments, including potentially some in the field-grade ranks. Consequently, the old navigator's dream of flying for a few years as a line flyer in a squadron then escaping to non-flying jobs, but with the potential to still fly for proficiency four hours a month and collect flight pay, was over. Navigators in the rank of major or even lieutenant colonel might be forced to return to full-time flying under lieutenant or captain pilots in order to meet their final gates. This might be more digestible if the navigator had at least the theoretical possibility of earning positions of authority and command in the flying unit. Furthermore, there was the potential that any



reasonably intelligent person might see that the Navy had a better deal for navigators since Naval Flight Officers (navigator equivalents) could and were already commanders of flying units. The Air Force officer corps needed its navigators, and it had to take steps to make navigator membership more amenable, and not second-class.

Although the Air Force officer corps appeared somewhat interested in redressing navigator claims of discrimination in FY1975, it ignored the issue of discrimination with respect to non-rated officers. In August 1975, the Air Force had a total of 3691 command billets (flying and non-flying from squadrons and detachments up to bases, wings and installations) for the rank of colonel and below. Pilots filled 1505 (41%) of these billets, navigators 422 (11%), and non-rated officers 1764 (48%).<sup>214</sup> As of 30 June 1975 the Air Force officer corps consisted of 32% pilots on flying status, 14% navigators on flying status, and 54% non-rated (includes pilots and navigators not on flying status and flight surgeons in addition to purely non-rated) officers. From a proportional basis, pilots were overrepresented in command billets, while navigators and non-rated officers were underrepresented. On the other hand, if only 350 command billets required flyers and were units populated with flying officers, one might expect non-rated officers to fill most of the command billets not requiring flying ratings. This, however, is not the case since pilots filled approximately 1165 non-flying command billets while navigators filled approximately 412 non-flying command billets. Another way to portray this data is that 77% of pilot commands and 98% of navigator

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<sup>214</sup> "10 Navs Head Flight Units," Air Force Times 10 Sep 1975: 24.



commands were over non-flying units, i.e., the only units that non-rated officers could command since they were prohibited by the Air Force, but not by statute, from commanding flying units. This illustrated the major trickle-down effect of the policy that only flying units could be commanded by flying officers. Flying officers were also given priority over non-rated officers for non-rated commands.

In its report on the 1974 Career Motivation Conference, issued in the summer of 1975, the Air Staff reported that as a consequence of the new law eliminating the restriction that only pilots can command flying units:

Air Force policy is *now* that *all* Line officers will be eligible to command Line units. Only the best qualified Line flying officers (pilots and navigators) will be selected to command flying units. Only the best qualified Line officers will be selected to command other Line units.<sup>215</sup>

The policy indicates not only the change to allow navigators to command flying units, but also a broader possibility for non-rated line officers to compete more fairly for non-flying units. However, that possibility hung on the wording *best qualified*. If *best qualified* meant qualification in terms of knowledge and experience in performing the unit's mission, then the non-rated maintenance officer, for example, would always appear to be best qualified. If *best qualified* was measured in terms of mastery of the Air Force's primary mission and the officer's potential for further command and promotion, pilots and navigators would get the nod, at least until the Air Force ran out of rated officers to take the non-flying commands. After all, some rated officers had to

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<sup>215</sup> Lee Ewing, "Some Career Ideas OKd, 12 Killed," Air Force Times 13 Aug 1975: 4. *Italics added*.

command flying units, serve on staffs, and fly; so the supply of rated officers was not unlimited. Non-rated officers had to be able to fill in when rated officers simply were not available or interested.

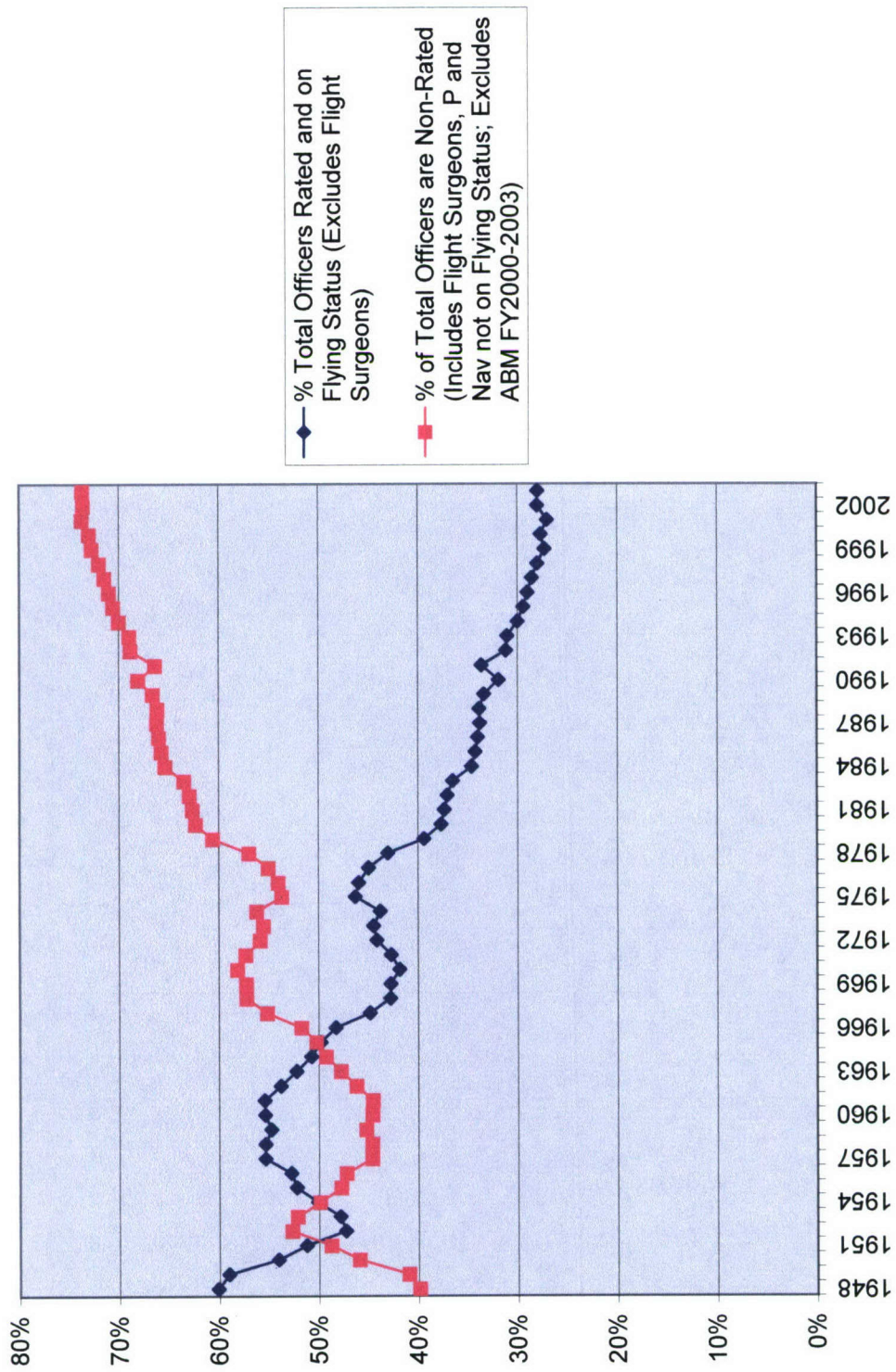
If the Air Force was indeed all about flying, a pilot rating was not only the measure of a man, but also a prerequisite for leadership in the Air Force. Flying skill could serve as a proxy variable of sorts for leadership potential. “Great hands” might not equate exactly to great leadership skills, but nobody would fly with or follow a pilot of borderline competence. In the old days, there was a certain sense of natural selection about it. Only a pilot with the *right stuff* could survive flying long enough to achieve rank sufficient to command other flyers. Furthermore, when a majority of officers were pilots, having the *right stuff* made sense. A group of people with the *right stuff* could only really be led by someone at least equally endowed with it. Since everything in a flying air force was connected somehow to flying, pilots should naturally command all important as well as all flying units. The decision to allow navigators to command flying units in 1974 was a dramatic shift in the profession’s mind-set, which partly explains the Air Force’s emphasis that this would be an evolutionary and very gradual change. After all, navigators at least had a rating, rode in aircraft, and wore wings. Consequently, navigators could lay some claim to command of flying units as well as to an oblique priority for command over non-flying units. Navigators might have a touch of the *right stuff*, and they knew first-hand what the Air Force was all about—flying and putting ordnance on target. Non-rated officers, however, were technical specialists,

there to support flying operations and the overall management of the bureaucratic functions necessary to keep any large organization functioning smoothly. Non-rated officers had no claim whatsoever to command flying units. Since they could not rise to the profession's top echelons as combat commanders, they should not block rated officers from gaining experience in non-flying fields so that the Air Force would have a large pool of well-rounded, rated (primarily pilot) officers from which to select future general officer leaders.

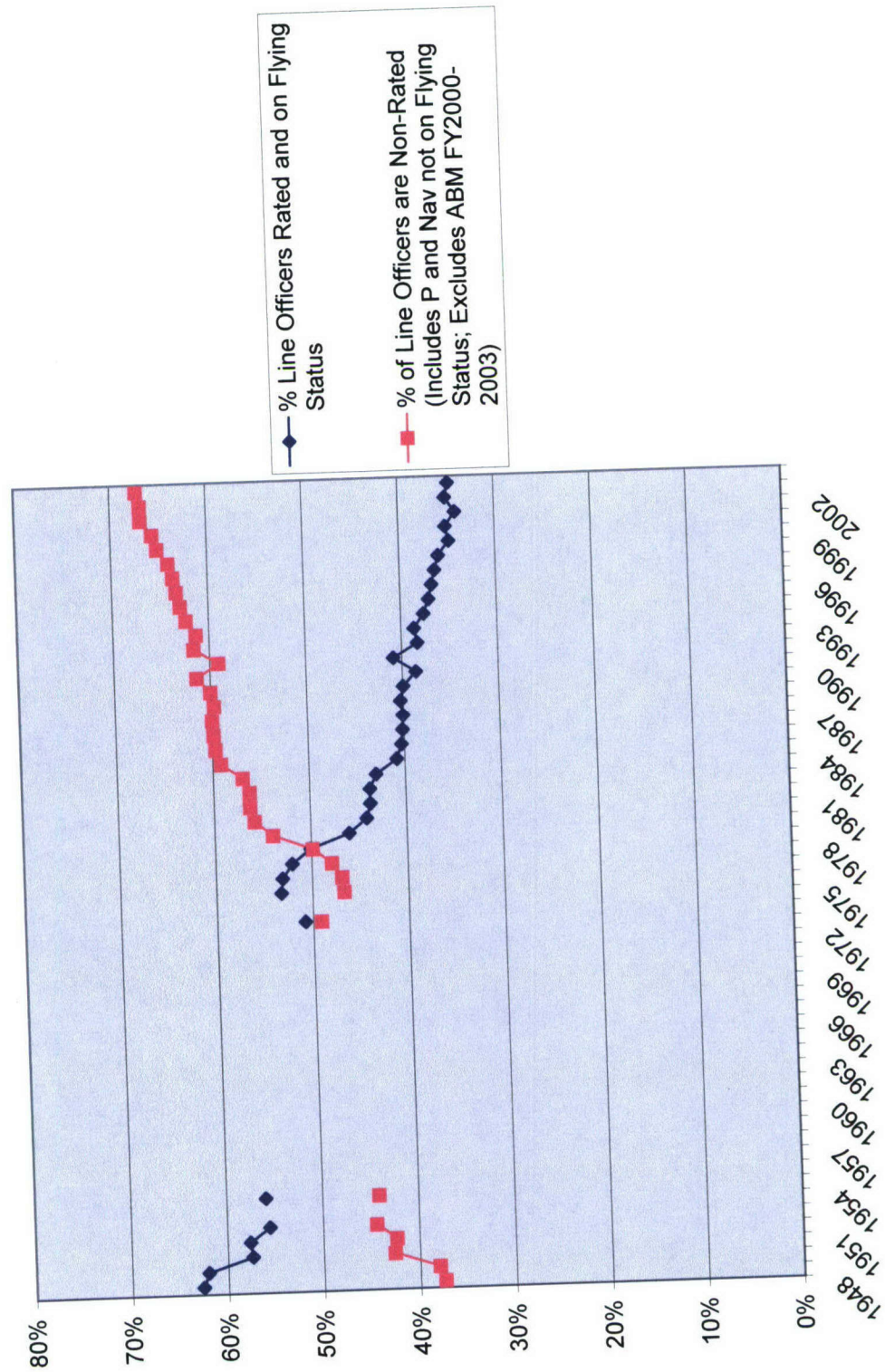
This was still the profession's dominant conceptual framework in 1974. However, the statistics already belied that framework. The percentages of the officer corps that were pilots and navigators, i.e., the percentage of rated officers on flying status of the total Air Force officer corps, crossed 50% in the downward direction for the final time in FY1965. See Chart 7-9 (Comparison of Rated Officers on Flying Status versus Non-Rated by Percent of Total Officers). From that point on, not only pilots, but rated officers on flying status in total were a minority in the officer corps. Switching to a comparison using only line officers forestalls the inevitable 50% mark until FY1978, but the trend is already clear because of the earlier decision to decrease the number of pilots and navigators trained annually. See Chart 7-10 (Comparison Percent Rated Officers on Flying Status versus Percent Non-Rated Line Officers). In fact, pilots had been a minority within the line officer category since FY1950. See Chart 7-11 (Comparison Pilots on Flying Status as Percentage of Total Officers versus as a Percentage of Line Officers). Even with large numbers of pilots serving in non-



**Chart 7-9: Comparison of Rated Officers on Flying Status versus Non-Rated  
by Percent of Total Officers**

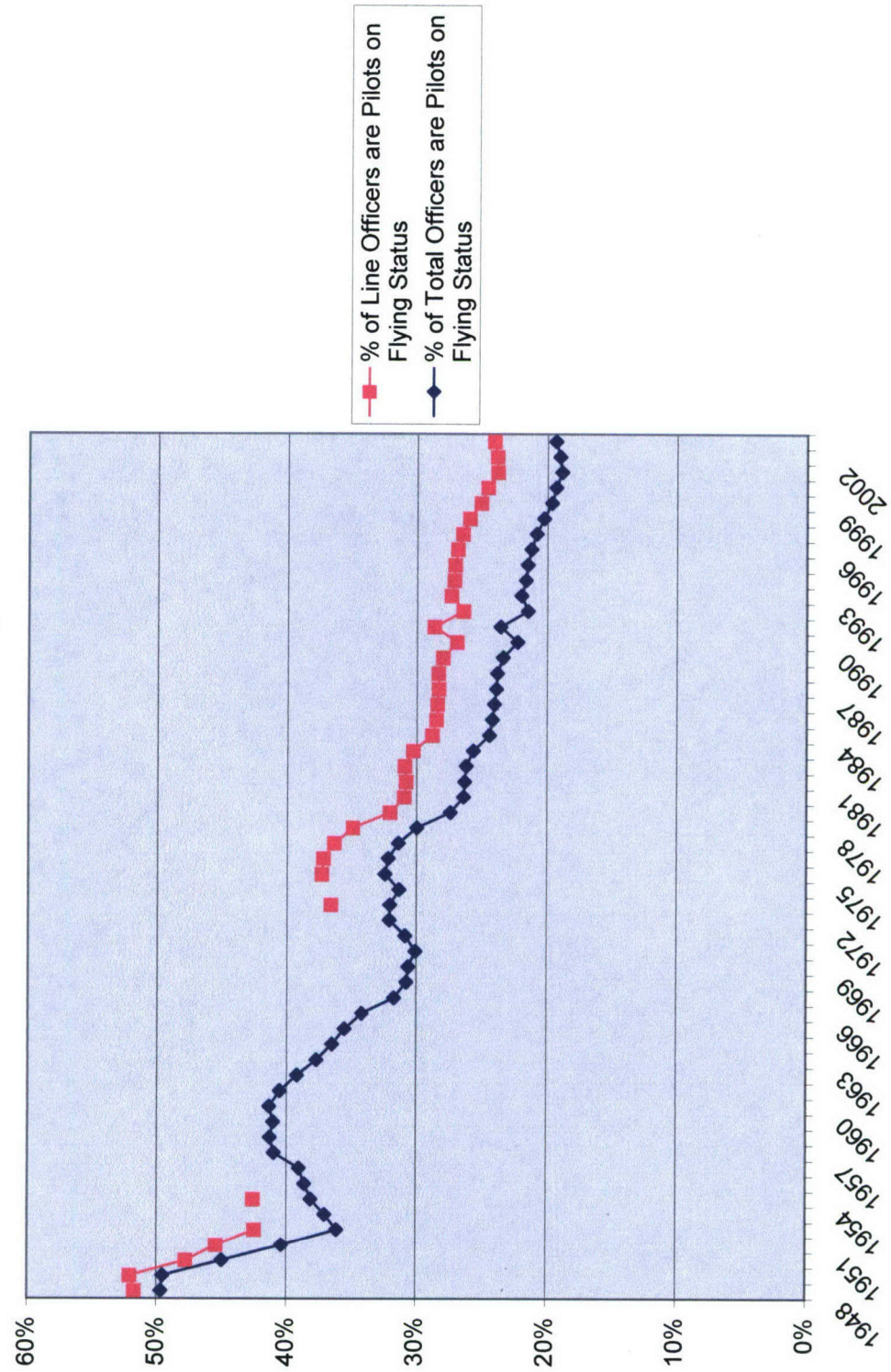


**Chart 7-10: Comparison Percent Rated Officers on Flying Status versus  
Percent Non-Rated Line Officers**





**Chart 7-11: Comparison Pilots on Flying Status as Percentage of Total Officers versus as Percentage of Line Officers**





rated billets, the Air Force still needed more non-rated officers than pilots. In 1965, the Air Force investigated its inability to retain larger numbers of non-rated officers. The investigating committee found a variety of reasons for the non-rated officer exodus that centered around non-rated officers' limited opportunities for career advancement. In particular, non-rated officers voiced discontent with the practice of placing rated officers in non-rated supervisor billets ahead of more qualified non-rated officers. In addition to shutting non-rated officers out of promotions, this practice also adversely affected units' abilities to meet mission requirements. Non-rated officers also reported that the term *non-rated* was pejorative and that the lack of non-rated specialty badges in comparison to the "wings" worn by rated officers on their uniforms symbolically and visually reinforced the separation and thereby lower status of non-rated officers. The committee recommended that the term *non-rated* be dropped, that assignment policies be changed to give non-rated officers better opportunities for career advancement and that badges be developed for all officer specialties. However, the committee did not attribute the number of rated officers serving in non-rated billets to any sort of Air Force policy to maintain a reserve pool of rated officers to handle an initial wartime surge in the need for trained pilots. Nor did it justify the pilots serving in non-rated billets as an Air Force need to career broaden future pilot leaders. Instead, it saw the problem as one in which poor non-rated retention rates forced the Air Force to use rated

officers in non-rated billets.<sup>216</sup> That conclusion, however, implied that if the Air Force could get enough non-rated officers, it could cut its pilot levels even further.

#### Air Force Traditions of Wings Versus Non-Rated Badges

The Air Force continued to use the term *non-rated* because the distinction between *rated* and *non-rated* was real in terms of command and promotion opportunities, status, and income. The Air Force did adopt badges for non-rated officer specialties, although General McConnell, as Air Force Chief of Staff, seemed opposed to the general idea.<sup>217</sup> In addition, there are important distinctions between *wings* and *badges*. Flyers (pilots, navigators, air battle managers, flight surgeons, flight nurses and non-rated officer aircrew members) are awarded *wings*, which are required to be worn on all uniforms. Astronauts of course wear *wings*. Non-rated officers have career specialty *badges*, and their wear is optional. *Wings* look like the outstretched wings of a falcon, ready for flight, with one of various shields centered where the bird's body would be. *Badges* typically have some sort of symbol indicating the career field or functionality of the bearer and are often surrounded by compressed wreaths. The only exception are the parachutist *wings*, which actually look like a *badge*.

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<sup>216</sup> Mitchell 343-344.

<sup>217</sup> Rated officers were not enthralled with the plethora of non-rated badges. In 1969 General McConnell, Air Force Chief of Staff, provided specific guidance to the Uniform Board that restricted the creation of new non-rated career-field badges. Specialties requiring badges were broken down into four categories: 1) Functional badges for non-line officers and AF Academy permanent professors; 2) Flying functions that "require specific training, qualification and actual participation in flights of air and space vehicles," i.e., wings; 3) Emergency and law enforcement; and 4) Other badges that do not fit into the above categories like the missile and weapons controller badges. However, Category 4 is "closed." Air Force Times interprets this to mean that the "AF apparently is saying these badges slipped into the inventory without really being justified but that won't happen again." See "Job Specialty Name Tags OK'd...But," Air Force Times 8 Jan 1969: 3.



*Badges*, like *wings*, can be awarded in two advanced levels. The first advanced level is *senior* with the star on top of the badge. The highest level is marked by the star encircled by the wreath, but as in the case of navigators, for non-rated officers, this level is called *master*, not *command*. In addition, the qualification time to achieve senior and master levels were much shorter for *badges* than for *wings*, to the tune of three instead of seven years for senior and seven instead of 14 for command/master. One effect of this shorter period to senior status was the implication that *badge*-type jobs were easier to master than *wings*-type jobs. In addition, using shorter periods to award advanced badge levels also let rated officers collect merit badges that implied the wearer had gained a higher level of expertise in a non-rated field while on non-flying tours. Furthermore, the qualifications for badges vary; the wear of some badges can be somewhat misleading. For example, the space/missile badge could be awarded for operations, maintenance, or acquisition work. Many rated officers wear the space/missile badge because they helped buy space or missile systems or subsystems, not because they have any actual experience with space or missile operations. It is hard to imagine the officer corps awarding pilot wings to all the non-rated officers involved in aircraft acquisitions.

The saga of the *wings* versus *badges* with respect to the bearer's status and closeness to the core of the profession continues. Every career field is now potentially covered by some sort of *wings* or *badge*, and two have made the jump from being a *badge*-type job to a *wings*-type job since 1998. The first is the air battle manager career

field, which became a rated career field and is examined in more detail in the section below. The second is the space/missile badge. It is probably not coincidental that officers serving in both of these specialties form a large part of C4ISR personnel. The space/missile badge story carries cultural overtones, since the career field has not been given rated status.<sup>218</sup> Instead, in a nevertheless major break with tradition, in FY2006 the Air Force allowed the non-flying space/missile badge to take on the appearance of wings. Although certain wings like those worn by flight nurses and non-rated officer aircrew members have never been associated with an aeronautical rating *per se*, the wearers of those wings served on aircraft. The space wings, or “swings,” as they are pejoratively called by some officers, are awarded to operators, maintainers, and acquisitions officers associated with space and missile systems. The swings are an indication of the officer corps recognition of the importance of the space/missile field to the profession. The symbolic elevation of this career field to “flying” status is one more indication of the evolutionary broadening of the inner core of the profession’s membership.

#### The Air Battle Manager Elevation to Command of Flying Units and to Rated Status

The origins of the Air Battle Manager (ABM) career field dates back to the Battle of Britain in World War II. The ABMs are the descendents of the intercept controllers on the ground directing the fighter scrambles and the interception of the German

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<sup>218</sup> Similar cultural overtones are present in the evolution of the decisions on which Air Force personnel can wear leather jackets as part of the uniform and whether missile launch officers can wear flight suits.



bomber raids. Although initially ground-based, the concept of an aircraft carrying a large-area surveillance and aircraft control radar with intercept controllers aboard dates back at least to the closing days of World War II when Admiral Nimitz pursued the creation of such aircraft to augment ship- and shore-based radar defenses against Japanese kamikazes for Operation Olympic, the invasion of Japan.<sup>219</sup> The Air Force's first operational command and control radar aircraft was the EC-121, which remained in the active inventory from the mid-1950s through the mid-1970s, and was primarily designed to augment the ground-based air defense coverage. Although weapons controllers were part of the crew, the vast majority of the officers in the weapons controller (later renamed air battle manager (ABM)) career field worked on the ground, either in fixed, strategic air defense centers or mobile, tactical radar and command and control units. EC-121s demonstrated the utility of airborne command and control aircraft in tactical warfare during Vietnam, so the EC-121's successor, the E-3 AWACS, was placed under Tactical Air Command instead of the decaying Aerospace Defense Command. Weapons controllers also provided the backbone of the ABCCC system, which flew as a capsule inside specially modified C-130 aircraft. The ABCCC also proved to be a critical piece of air-to-ground operations in Vietnam, and its successor, the E-8 JSTARS is also crewed by ABMs. With the advent of AWACS in the late 1970s, the percentage of ABMs in flying positions began to climb steadily.

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<sup>219</sup> Richard B. Frank, Downfall: The End of the Imperial Japanese Empire (New York: Random House, 1999) 186.

This process was accelerated when the Air Force turned the strategic air defense mission over to the Air National Guard, when JSTARS started to come on line during Desert Storm, and as the Air Force retired ground-based radar command and control units in the 1990s.

Previously ABM officers earned the weapons controller *badge* upon completion of the basic course, and then were sent to system-specific courses before going to the field. Most ABMs served in ground units. ABMS typically commanded the mobile ground radar squadrons, although these squadrons tended to be amalgamated into fighter groups and wings with the ensuing glass ceiling. Fixed, strategic defense operations centers were commanded by pilots, with ABM deputies. ABMs serving in flying positions for the odd tour or two were awarded officer non-rated aircrew *wings* to wear in addition to, and above, their ABM badge. As early as 1982, however, the Air Force began to send 2<sup>nd</sup> lieutenants directly from the basic weapons controller course and without ground ABM experience directly to AWACS assignments, with the prospect that these officers might only serve one or two ground ABM tours in a 20-year career. Consequently, for these officers, aircrew duty was not going to be an exotic experience, but their career emphasis. These officers would fly as many hours as their rated navigator and pilot colleagues, they would populate more of the onboard AWACS crew positions, and they would perform the aircraft's primary mission, but they could not command the aircraft or the squadron, nor were they eligible for flight pay or bonuses. Only pilots can be *aircraft commanders* in the Air Force. An aircraft is after



all an airplane, fraught with danger, where the lieutenant or captain with one hand on the wheel or stick, the other on the throttles, and his feet on the rudders commands *everything*. An aircraft is not an air ship, with a flight section, a navigation section, a radar section, a communications section, and an air battle management section each subordinated to a field-grade mission commander. With respect to squadron command, only pilots were considered eligible for squadron, group and wing command. The 1974 amendment to the US Code eliminating all requirements for commanders of flying units to be pilots or rated officers was a meaningless, and probably unfamiliar, scrap of paper. Finally, non-rated ABMs were paid hazardous duty pay on a lower scale and without the rated gate system. ABMs were only paid when on flying status and logging four hours a month (with a limited carryover of hours).

The situation was certainly as bad as it had been for navigators, and further complicated by the high operations tempo of AWACS. As General Ralston later explained, "We started flying AWACS in Saudi Arabia in 1979 and kept guys flying there 24 hours a day, 365 days a year for 10 years."<sup>220</sup> Additionally, AWACS flew in support of every operation and major exercise; so aircrews and maintenance crews spent large amounts of time away from home. Desert Storm and the resulting No-Fly zones accentuated the problem. As General Ralston said, "If you had been in the AWACS community" before 1994, "all you had known was 200 days a year away from home. It

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<sup>220</sup> George Wilson, "Leaders heed the AWACS lesson: Ways are sought to avoid an exodus of overtaxed crews," *Air Force Times* 26 Jan 1998: 7. General Ralston (USAF) was serving as Vice Chairman of the Joint Chiefs of Staff in 1998, but was Air Force Deputy Chief of Staff for Plans and Operations in 1994-1995. It was in that capacity that he took steps to better conditions for AWACS crews.

was driving AWACS into the ground.”<sup>221</sup> However, there was an important difference between the flight crew (two pilots, one navigator and an enlisted flight engineer) and the mission crew (ABMs, and enlisted communications, radar and computer technicians). Pilots and navigators could more easily rotate tours between AWACS and other aircraft such as tankers, but ABMs and the enlisted aircrew members, as well as the AWACS maintenance and computer-support personnel, were increasingly stuck in AWACS or JSTARS units, which fared no better. Of course, an ABM could break up the AWACS pace by opting for a one-year assignment without family to a remote radar post. Seeing a future full of time away from home, no hope for advancement to positions of responsibility, low promotion rates, and flight pay inequities, ABMs resigned. The officer corps had undervalued ABMs, undersold the career field to officer recruits, and did not significantly adapt the training pipeline to meet the AWACS and JSTARS demand. There was a perpetual shortage of ABMs. As more resigned, the remainder had to do more, creating a snowball effect. ABMs could not leave the career field, could not be spared for broadening or schools to enhance their promotability, and of course could not take promotable positions from future pilot leaders. Consequently, as ABMs’ promotion chances continued to decline, more would leave.

The Air Force’s responses were varied. An early action, taken in the mid-1980s was to create a non-flying, training squadron within the AWACS wing so that there was

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<sup>221</sup> George Wilson, “Leaders heed the AWACS lesson,” 7.



at least one AWACS squadron command for ABMs. This was a small offset to the number of disappearing ground ABM commands. Perhaps the most innovative solution was the decision to make enlisted weapons controllers in 1991. The enlisted weapons controllers would overlap with officers in the lower ABM crew positions. Only officers could fill the highest ABM positions in aircrews, but lieutenants, for example, could serve functionally under noncommissioned officers as they learned the tools of the trade. This was a radical variation of the concept that rank has no meaning in the air, and symbolically devalued the ABM career field. After all, Huntington purposefully excluded enlisted personnel from his definition of the military profession. Furthermore, enlisted weapons controller trainees occupied officer trainee spots since the training was the same; so the process did not speed up the replacement process. In addition, the enlisted weapons controllers frequently came from the surveillance technician career field; so there was an element of musical chairs to fill the gap; not bringing totally new personnel into the field. Nonetheless, the enlisted weapons controller solution has remained in force in the ABM case. Curiously enough though, the Air Force has never implemented an enlisted solution to resolve pilot and navigator manning difficulties.

Another solution was the development of an AWACS reserve unit to help man the active aircraft along the lines of the model already in use with cargo aircraft. JSTARS went to an even more extreme form of mixed active duty and National Guard personnel on National Guard owned aircraft. These solutions once again press or exceed the bounds of Huntington's definition of the officer corps as a profession since

reservists are in a quasi professional state. The Air Force has also implemented “stop-loss” on occasion to maintain its ABM force, as well as its pilots and navigators. Stop-loss prevents personnel in general, or in specific career field from leaving active duty during times of war or tension.

Finally, in the late 1990s, after the other solutions had already been implemented, the Air Force officer corps returned to the 1974 navigator model. If the profession needs the skill, it should value those that provide it and embrace them within the profession’s core membership. Consequently, the senior Air Force officer leadership implemented a series of actions to raise the status of ABMs. First of all, since the 1974 act abolished all requirements for command of flying units, it was suddenly possible to name a non-rated ABM to command of an AWACS flying squadron. This occurred in January 1997 when Lieutenant Colonel John Kennedy, an ABM, was selected to command the 963<sup>rd</sup> AWACS. This made him the first non-rated officer to command a flying unit in the Air Force’s history. Furthermore, the 963<sup>rd</sup> was an operational, not merely a training, squadron, which gave the event a bit more prestige. Lieutenant Colonel Kennedy was followed by other ABMs in command of AWACS squadrons and even the Operations Group, but on 1 October 1999, ABMs became a rated career field.<sup>222</sup> This step also did not require Congressional

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<sup>222</sup> The Operations Group is a colonel-level position, also over a flying unit. No non-pilot has ever commanded an AWACS wing. Furthermore, the rating status issue took considerable time to work its way through the system. Discussed for years, the Air Force’s most senior general officers agreed to the change in February 1998. Air Force Times speculated that it would be implemented in October 1998, but



intervention. The 1940 amendment to the National Defense Act had already defined a flying officer as an officer “who has received an aeronautical rating as a pilot of service types of aircraft or one who has received an aeronautical rating as an aircraft observer or as any other member of a combat crew under such regulations as the Secretary of War may prescribe.”<sup>223</sup> The general concept that officers who are members of combat crews and not pilots or navigators can be rated officers has existed in the US Code since then. The change to rated status resulted in new ABM *wings*, as well as flight pay and the gate system used for pilots and navigators. Furthermore, it opened the possibility of using ABMs to fill rated staff positions, which could then free other rated officers, i.e., pilots to return to flying or command positions. However, this was unlikely since the ABM career field remained critically manned. Only 74% of ABM billets were manned in October 1999.<sup>224</sup> The last part of this anti-discrimination package appeared in 2002, when the Air Force offered bonuses for the first time to non-pilot aviators. Both ABMs and navigators were offered bonuses, although ABMs and navigators received a maximum of \$15,000 per year for a five-year service commitment extension, compared to the \$25,000 given to pilots. Nevertheless, non-pilots saw it as recognition of the importance of their role in the profession, and the Air Force saw it as a way to keep up

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it was not for another year. See Bryant Jordan, “Air-battle managers will be rated: New status for career field may begin in October,” Air Force Times 25 May 1998: 4.

<sup>223</sup> Pub. L. 76-795, p. 963.

<sup>224</sup> Jennifer Palmer, “Air-battle managers get rated status: Move means incentive pay, better career opportunities,” Air Force Times 18 Oct 1999: 35.

retention, in particular with an eye to placing many of the committed navigators into staff positions to free up pilots for non-staff duties.<sup>225</sup>

### Conclusion

The navigator, ABM and space/missile cases demonstrate the non-linear evolution of the Air Force officer corps' concept of self and its inner core membership. The officer corps initially strove to become and to maintain an organization whose membership was almost completely pilot-based. Finding this unworkable, it resolved itself to an inner core of pilots, surrounded in the next ring by observers and navigators. Only pilots, however, could command flying units, the Air Force itself, and all important entities in between. Finding itself unable to function without navigators, the officer corps pressed Congress to remove statutory restrictions on command of flying units in 1974. The restrictions were originally enacted at the behest of the officer corps. Although this technically opened the door for any Air Force officer, regardless of rating or career specialty, to command a flying unit, only navigators were initially permitted this privilege. Whereas the battle over the importance of navigators was largely fought with statutes, the officer corps prohibited, under the guise of policy, ABMs from command over AWACS flying units until 1997 and ABMs from rated status until 1999—although ABMs had been serving as flying crewmembers of combat-support aircraft since the mid-1950s. Nevertheless, the replacement of the statute-based ceiling

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<sup>225</sup> Gordon Trowbridge, "New retention bonus brings navigators, ABMs out in droves," Air Force Times 18 Nov 2002: 22. Gordon Trowbridge, "Aviator bonuses tell nonpilots they count, too: Officers: First-time perk a big step toward recognition," Air Force Times 19 Aug 2002: 24.



with a glass ceiling indicates an increased status and the long-term potential for air battle managers, one of the core C4ISR career fields, to rise to the most senior ranks. Furthermore, in FY2006, space/missile *wings*, or *swings*, were authorized, granting the space/missile career fields symbolic inner core membership in the officer corps. However, the officer corps' decision to grant ABMs rated status soon after ABMs were allowed to become flying unit commanders indicates that the door to command of flying units is once again shut to non-rated officers since pilots, navigators and ABMs currently provide the only commanders to flying units, and all three specialties are rated. The *swings* symbolize inner core status, but not an aeronautical rating. The elevated status recently afforded to ABMs and space/missiles signifies the elevated status of C4ISR to the officer corps since ABMs and space/missile officers provide a large part of the C4ISR personnel.

The combination of issues captured under the concepts of wings, ratings, and the profession's inner core will continue to be problematic for the officer corps. For example, the officer corps is still grappling with how to classify and train "pilots" and back-seaters" for UAVs and UCAVS. The Air Force has had problems getting "real" pilots to take UAV tours, and it has used in-theater civilian contractor pilots to fly take-offs and landings, but Air Force pilots in Nevada to fly the UAVs during combat operations in the Middle East. UAV pilots may not need as much pilot training as onboard pilots. The "back-seater" is also problematic, depending on what responsibilities are involved, and whether there is actually one, or several "back-

seaters.” In addition, it is not clear how the communications, computers, information warriors and intelligence personnel fit into the professional constellation. Finally, although the Air Force has been quite willing to place fighter, bomber and transport pilots in charge of AWACS and JSTARS units, ABMs and most navigators are unlikely to make the transition to command of flying units with which they have no experience. ABMs and navigators have become squadron and group commanders of units flying aircraft that they are qualified in, but no one expects ABMs or navigators to become commanders of single-seat fighter squadrons.



## **Chapter 8: The Role of Commissioning Sources, an Active Duty Pilot Reserve, and Promotion System Bias in Pilot Overrepresentation in the General Officer Ranks**

### Introduction

This chapter continues the discussion begun in Chapter 7 on structural factors within the Air Force and its officer corps that have created or perpetuated the overrepresentation of pilots at the general officer level. Chapter 7 examined the relatively high level impact of the concepts that the officer corps should be 90% pilots and that only pilots could command flying units until 1974. This chapter actually goes down a level in detail in terms of structural factors affecting the overrepresentation of pilots at the general officer level. However, it is easier to explain the gist of this chapter with higher level questions. Consequently, this chapter begins with an examination of the basic question of whether pilots need to be officers. Although the Air Force officer corps has emphatically answered this question with a “yes” since achieving independence, the question serves as a springboard for examining the impact of Air Force officer commissioning sources, and the Aviation Cadet Program in particular, on membership qualifications for the officer corps’ inner core. The chapter then moves to another seemingly elementary question of how many pilot officers the Air Force officer corps actually needs. The answer to this question lies in ratios of pilot to aircraft, flight pay and bonuses, and the officer corps’ tradition of carrying an active-duty pilot reserve cloaked in non-pilot billets. The third and final section of this chapter examines field grade officer promotions for bias in favor of pilots or rated officers. Promotion bias

would go a long way in explaining the overrepresentation of pilots in the general officer ranks.

#### The Impact of Commissioning Sources on the Composition of the Officer Corps

In the independent Air Force, there has never been a question of whether pilots need to be commissioned officers. They simply are. However, that was not always the case in the Air Force's predecessors. The question is consequently an important one because it links directly to the issues of profession and expertise. It brings the discussion back to Chapter 2 and Chapter 3 and the question of whether piloting is an expertise worthy of professional status or simply a trade skill. The Air Force officer corps has studiously avoided the question. In fact, the officer corps has turned the issue on its head and awarded pilots professional status through the following perverted logic: Since all pilots are commissioned officers; and commissioned officers form a profession; pilots have professional status and professional expertise. This formulation perpetuated the misperception that flying is the Air Force officer corps' expertise and that those who fly form the inner core of the profession. It also served to quickly and easily differentiate the Air Force officer corps as a separate profession from the Army officer corps. Finally, it obviated any need to conform to Huntington's criteria that members of a profession should have a broad liberal arts education as the foundation of their professional knowledge and that professionals find value in teaching professional knowledge to new members. This section of the chapter examines these issues in detail to show that the officer corps' policies to secure pilot trainees and its commissioning



sources were factors that created and perpetuated the overrepresentation of pilots in the general officer ranks.

One of the Army's earliest personnel decisions with respect to aviation was that enlisted men should provide a major part of the pilot pool. In the 1914 act that created the aviation section within the Army Signal Corps, set the manning of the aviation section at a maximum of 60 aviation officers and 260 aviation enlisted men. The act further stipulated, "that twelve enlisted men at a time shall, in the discretion of the officer in command of the aviation section, be instructed in the art of flying."<sup>226</sup> This revolving door of enlisted pilot trainees would permit the aviation section to build up a pilot pool independent of the interest of Army officers in other branches for pilot training and aviations service. The 1916 National Defense Act threw open the door to pilot training to enlisted men: "The Secretary of War shall have authority to cause as many enlisted men of the aviation section to be instructed in the art of flying as he may deem necessary."<sup>227</sup> Furthermore, the 1916 act stipulated that civilians could be directly recruited into the aviation section to fill officer manning shortfalls:

That, when it shall be impracticable to obtain from the Army officers suitable for the aviation section of the Signal Corps in the number allowed by law the difference between that number and the number of suitable officers actually available for duty in said section may be made up by appointments in the grade of aviator, Signal Corps, and that grade is hereby created. The personnel for said grade shall be obtained from especially qualified civilians who shall be appointed and commissioned in said grade.<sup>228</sup>

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<sup>226</sup> Pub. L. 63-143, p. 516.

<sup>227</sup> Pub. L. 64-85, p. 175.

<sup>228</sup> Pub. L. 64-85, p. 175.



World War I saw the first mass application of the principal of turning civilians directly into pilots and flying officers.<sup>229</sup> This training program produced both pilots and observers.

In July 1918 during the World War I buildup, Congress made clear that medical qualification and physical skills, not education, were the prerequisites for flying officers. "No person otherwise qualified for service as a flying cadet, pilot, or other officer in the aviation service, shall be barred from such service by reason of not being equipped with a college education."<sup>230</sup> In 1919 Congress statutorily established the grade of flying cadet, and stipulated that the Air Service could have at any one time a maximum of 1300 flying cadets, five hundred of whom could be enlisted. The 1919 act also statutorily established that upon satisfactory completion of a flying cadet course, each graduate could choose to be discharged and then accept a commission as a second lieutenant in the Reserve Officer Corps.<sup>231</sup> However, the commission in the Reserve Officer Corps was not an active duty position so if an enlisted man wanted to remain on

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<sup>229</sup> By 2 June 1918, volunteer medical screening boards examined 38,777 men and disqualified 18,004 from entering flying training. The qualified cadets underwent an eight week ground school at one of several civilian universities. Those that passed ground school went on to primary flight training, which lasted another eight weeks. Graduates of primary flight training were awarded Reserve Military Aviator wings and an officer's commission and sent to advanced flying training. See Major General William L. Kenley, USA, Annual Report of the Director of Military Aeronautics, U.S. Army to the Secretary of War, 1918 (Washington: GPO, 1918) 8.

<sup>230</sup> 10 USC 293 1925.

<sup>231</sup> 10 USC 297 1925; 10 USC 299 1925.

active duty, he stayed enlisted. Consequently, enlisted men in small numbers continued to be rated pilots.<sup>232</sup>

The Secretary of War, the Army at large and Congress continued to push for more enlisted pilots. The 1926 amendment to the 1916 national defense act stipulated that "on and after July 1, 1929, and in time of peace, not less than 20 per centum of the total pilots employed in tactical units of the Air Corps shall be enlisted men, except when the Secretary of War shall determine that it is impractical to secure that number of enlisted pilots."<sup>233</sup> However, Major General Patrick, Chief of the Air Service, had previously told the Senate Committee on Military Affairs that he was not a proponent of the provision and that he had already conveyed this opinion to the Secretary of War.

General Patrick maintained that:

Legislation is not necessary to provide for the training of enlisted men as pilots. I am training now as many enlisted men as I can find who are competent to take that training. We have at the present time, I think it is about 55, enlisted men who have been trained as pilots and who are acting as such. It is a question as to what makes a man capable or qualifies him for this pilot training. I think he is more than just an aerial chauffeur. I think he must have a certain amount of intelligence and he must display that by his ability to pass proper examinations before we are justified in spending time and money in training him. The flying cadets are taken in after an examination which necessitates not more than an ordinary high-school education. Many of the candidates fail. Any enlisted man may now apply for appointment as a flying cadet. If he passes that examination, he may come in and be trained. Unless they pass at least this qualifying

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<sup>232</sup> Reorganization of the Army Air Service: Hearing Before the Committee on Military Affairs United States Senate, Sixty-ninth Congress, First Session on S. 2614, A Bill to Increase the Efficiency of the Air Service of the United States Army, February 5, 1926 (Washington: GPO, 1926) 18.

<sup>233</sup> Public—No.446—69<sup>th</sup> Congress, 2.



examination, I think it is a waste of time to teach them to fly. ... I am qualifying now all the enlisted men I can find who can take this training.<sup>234</sup>

General Patrick went further and explained that he was not really interested in producing large numbers of enlisted pilots. Instead, he stated that, "I want to get in young men from colleges and schools and men of that kind to learn to fly—really officer caliber. Those are the ones I would like to have."<sup>235</sup> Consequently, the Chief of the Air Service in 1926 has a clear preference for college-men, not merely high school graduates, as the foundation of his pilot trainees because the college-men are *really officer caliber*. If these men were not available, then the minimum requirement for entrance into pilot training, whether for enlisted or civilians was to pass the flying cadet examination.

During World War II, piloting was still not automatically equated to commissioned officership. In fact, there were enlisted pilots, warrant officers pilots, flight officer pilots, and commissioned officer pilots.<sup>236</sup> Enlisted men and warrant

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<sup>234</sup> Reorganization of the Army Air Service 16-17. General Patrick also made an interesting comment on flight pay. When asked about incentives to get more qualified enlisted men to become pilots, General Patrick replied: "The only incentive would be—and I expect that applies to all of us—the higher pay. If they thought they would get higher pay, it might." Money, not an inherent interest in the joy and excitement of flying is the primary motivation for undergoing pilot training.

<sup>235</sup> Reorganization of the Army Air Service 17.

<sup>236</sup> Enlisted men served as pilots and observers, although in 1942 enlisted pilot positions appear to have been limited to students in pilot training and the liaison pilot rating (lowest pilot rating with restrictions on aircraft horsepower and assignments). Enlisted men also served as "bombardiers, navigators, and observers when assigned to combat crews in lieu of officers." See War Department, Headquarters Army Air Forces, "AAF Regulation No. 35-29, "Personnel, Military: Flying Status of Enlisted Men," (Washington, 20 Jul 1942). By December 1943, the Army Air Forces had occupational specialties for enlisted airplane pilot, enlisted glider pilot, enlisted liaison pilot-mechanic, enlisted service pilot, and enlisted bombardier. See War Department, Headquarters Army Air Forces, AAF Regulation No. 35-46, "Personnel, Military: Use of Military Occupational Specialties for AAF Enlisted Personnel," Washington,



officers with current ratings as pilots or observers could be appointed flight officers. Civilians who were qualified for pilot or observer ratings could also be directly appointed to the flight officer rank.<sup>237</sup> Flight officers could in turn be recommended for appointment to commissioned status as second lieutenants. A flight officer had to serve for at least three months as a flight officer, before being recommended for commissioned status. Each recommendation had to include the flying officers military record with the Army Air Forces that included training courses, and of course, his ratings. The promotion was not automatic: "In no case will a flight officer be recommended for commissioning unless he possesses such qualities of leadership, integrity, and professional ability as to make him especially desirable as a commissioned officer in the Army Air Forces."<sup>238</sup> Aviation cadets received their wings and active duty commissions upon graduation. However, this was also not an automatic process, at least in theory. Cadets were to be judged on "qualities of leadership, judgment, responsibility, military bearing, initiative, self-confidence, force of character, alertness, comprehension, cooperativeness, and attention to duty."<sup>239</sup> Cadets not meeting the standards would become flight officers at graduation.

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11 Dec 1943, pg. 2. Enlisted pilot opportunities had increased, but observer opportunities shrunk, most likely because of the increasingly technical nature of navigation and other observer duties.

<sup>237</sup> War Department, Headquarters Army Air Forces, AAF Regulation No. 35-3, "Personnel, Military: Eligibility for appointment as Flight Officers in the Army of the United States," Washington, 21 Jan 1943.

<sup>238</sup> War Department, Headquarters Army Air Forces, AAF Regulation No. 35-8, "Personnel, Military: System for Selecting Flight Officers to be Commissioned as Second Lieutenants in the Army of the United States," Washington, 12 Nov 1942.

<sup>239</sup> In addition, cadets were to be given a final examination stressing "the duties and responsibilities of officers" one month prior to graduation from their advanced flying course. The scores of the various

Pilots (and observers/navigators), who were not commissioned officers, quickly disappeared after World War II. The Army Air Forces reported 32,413 flight officers in 1945, making up 8% of the total commissioned, warrant and flight officers. The number of flight officers dropped to 1510 in 1946, and only three in 1947. The independent Air Force dropped the flight officer category entirely, but reported a few warrant officer pilots on flying status through FY1949 and some warrant officer observers on flying status through FY1952.

The independent Air Force officer corps' decision to limit piloting to an officer career path was interesting. It elevated the status of piloting, but did not change the prerequisites to pilot training, which had become a major and automatic portal to membership in the officer corps. For civilians and enlisted personnel, the route to pilot wings and a commission was still the Aviation Cadet Program. Candidates had to pass physical and academic examinations, designed to weed out those medically disqualified or lacking in aptitude, but college degrees were not a requirement. Successfully completing pilot training earned an automatic commission. From 1939, when the size of the program doubled in the pre World War II buildup through the mid-1950s, the Aviation Cadet Program was the major provider of the rated force. The program ended

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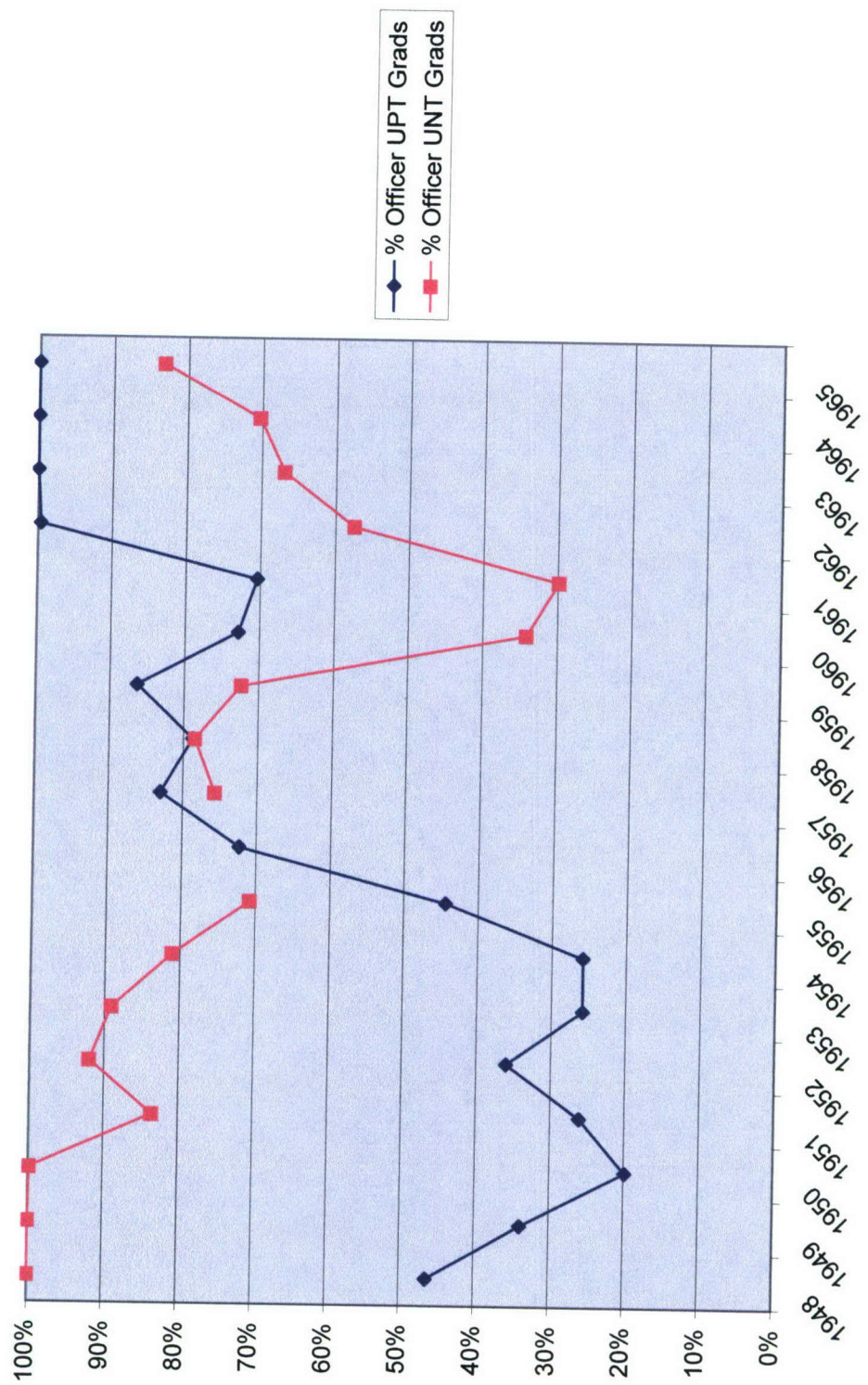
ratings on the officer's estimated professional proficiency made at each of the various courses, as well as the officers Aviation Cadet Mental Qualifying Examination (later the "Mental Alertness Score" from the Psychological Classification Test Battery) and the final exam were combined in a formula that gave the most weight to ratings from flying courses. The Commanding General of Flying Training Command set a minimum composite score. Cadets above the minimum became second lieutenants. Those scoring below became flight officers. See War Department, Headquarters Army Air Forces, AAF Regulation No. 35-9, "Personnel, Military: System for Selecting Aviation Cadets to be Commissioned as Second Lieutenants in the Army of the United States," Washington, 12 Nov 1942.



in FY1965. Its impact on the officer corps is shown in the Chart 8-1 (Comparison Percent Officer Student-Graduates for Pilot (UPT) and Navigator (UNT) Training (Rest are Aviation Cadets) FY1948-FY1965). Aviation cadets provided over half of the Air Force's annual Undergraduate Pilot Training (UPT) graduates from FY1948-1955, and provided 80% of the graduates in FY1950. Even from FY1956 through the last aviation cadet pilot trainees in FY1961, aviation cadets still provided roughly 15% to 30% of the UPT graduates. In addition, aviation cadets provided an ever-increasing percent of the Undergraduate Navigator Training (UNT) graduates from FY1950 through FY1961, when aviation cadets were 70% of the UNT graduates.

Although the pilots and navigators in the independent Air Force were all commissioned officers, most were not the *really officer caliber* college-educated men that General Patrick envisioned in 1926. The officer corps' reliance on the Aviation Cadet Program for so long had two major side effects. First, it permitted, and perhaps encouraged large numbers of men without college degrees to join the officer corps, and second, it established a clear correlation between piloting and officership. Since General Patrick's preference for college-educated men had set the pace until the Air Corps buildup began in FY1939, the senior (colonel and general officer) leadership of the officer corps was predominantly composed of officers with bachelor degrees through World War II and into the 1960s. In fact, a combined effect of World War II and the Air Force's independence was that some relatively young pre-1939 officers were quickly promoted to senior rank and actually served at the highest ranks for the

**Chart 8-1: Comparison Percent Officer Student-Graduates for Pilot (UPT) and Navigator (UNT) Training (Rest are Aviation Cadets) FY1948-FY1965**





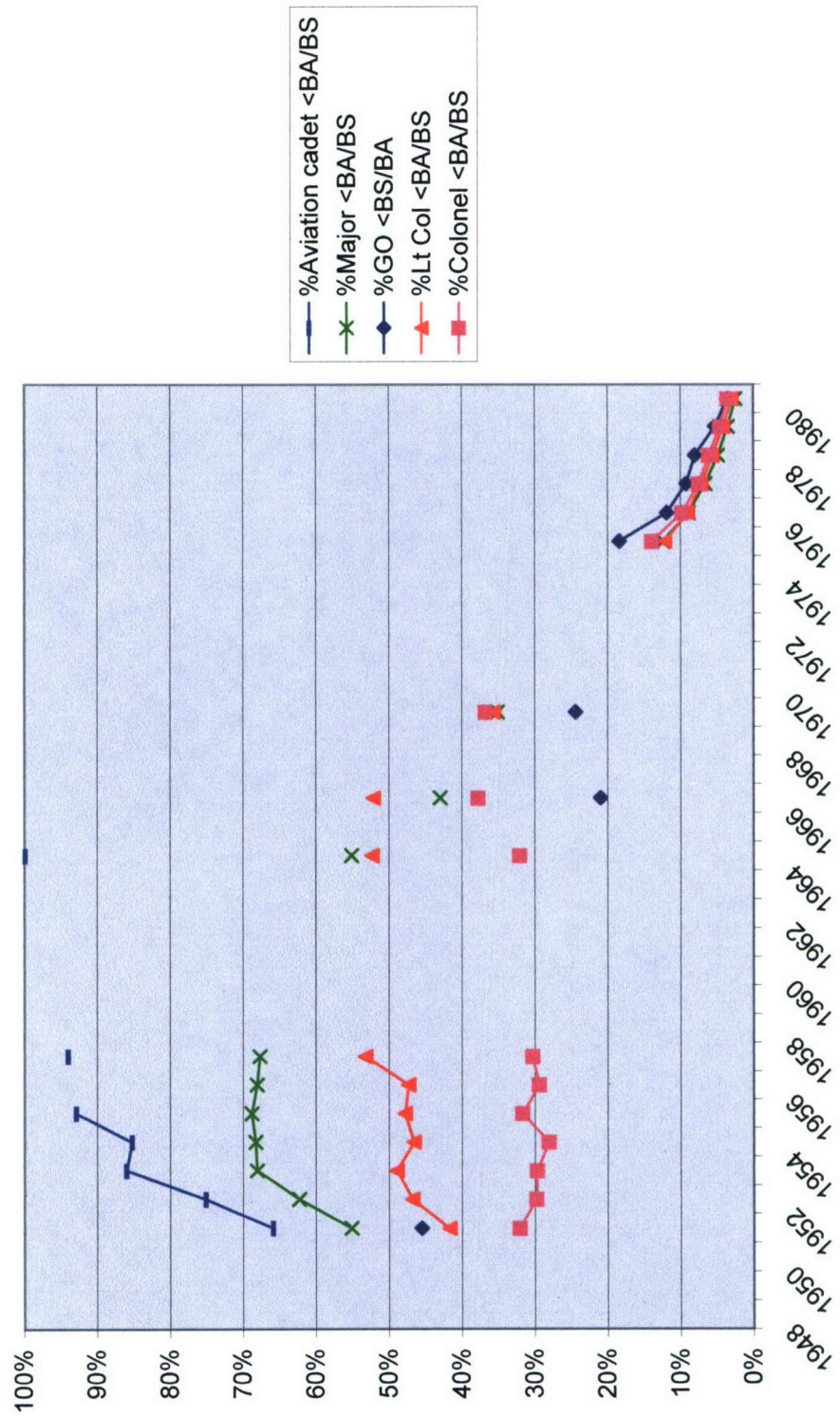
duration of the period from World War II into the 1960s.<sup>240</sup> The generally less educated mass of aviation cadets entering training between 1939 and 1945 served primarily in junior officer ranks during World War II. For example, in FY1951, 73% of the Air Force's rated officers did not have a bachelor degree.<sup>241</sup> From the mid-1960s on, officers who were former aviation cadets rose to senior ranks by sheer weight of numbers. However, it was not just sheer weight of numbers alone that accounted for their rise to senior ranks. These officers were pilots, and it was intended that they serve full careers unlike their ROTC-educated colleagues, who were expected to by and large serve shorter stints on active duty. Furthermore, the high percentages of aviation cadets without college degrees were not a World War II or even Korean War phenomenon.<sup>242</sup> Chart 8-2 (Percent Aviation Cadets and Officers with less than Bachelors Degree, by Rank) indicates that in FY1951 66% of the aviation cadets did not possess a bachelor degree. The percentage of non-degreed aviation cadets climbed not only throughout the

<sup>240</sup> General Curtis LeMay, for example, was one of these college-educated former aviation cadets and already a general officer when he led the fire bombing campaign against Japan as commander of the 20<sup>th</sup> Air Force. After the war, he served as the commander of Strategic Air Command from 1948 through 1957, then as the Air Force Vice Chief of Staff until 1961, when he became Chief of Staff of the Air Force until January 1965.

<sup>241</sup> The Air Force played all sorts of games with its statistical classifications to try to minimize this fact. For example, at times, it created categories for some college, less than two years of college, more than two years, more than three years and even four years but no degree to show that officers were indeed college educated, if not college graduates. The USAF Statistical Digest also dropped reporting on general officer education levels after its first year of reporting in FY1951, but continued to report levels for the other ranks through FY1957. In FY1951, colonels and lieutenant colonels both had higher percentages of officers with bachelors or higher degrees than general officers.

<sup>242</sup> Of course, during World War II, the length of service academy and ROTC commissioning programs were cut; commissioned officers from these periods and programs did not necessarily have bachelor degrees either. Furthermore, many of the former aviation cadets who were promoted through the system to general officer rank had bachelor's degrees.

**Chart 8-2: Percent Aviation Cadets and Officers with less than Bachelor's Degree, by Rank**



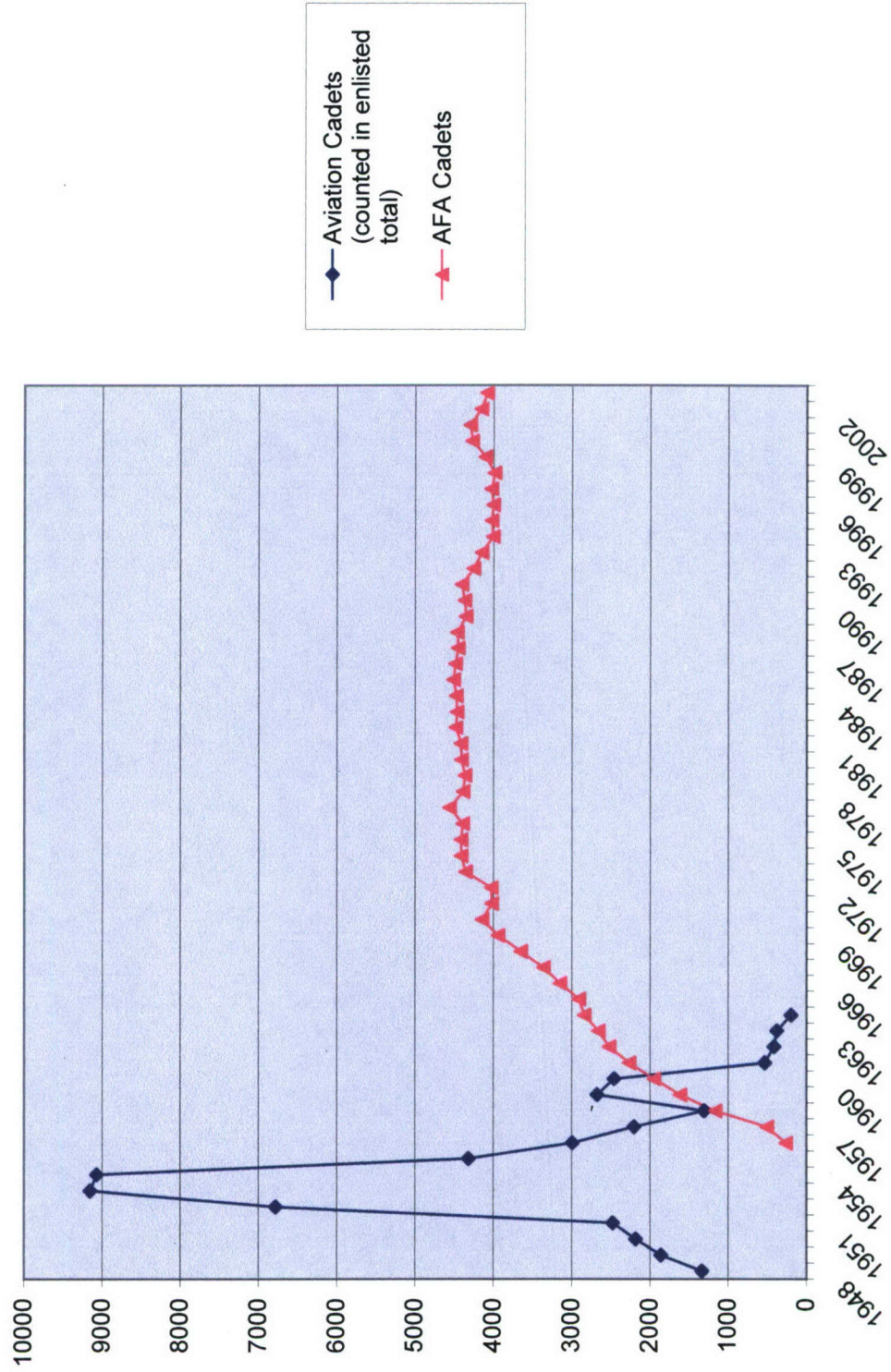


Korean War, but also afterwards into the Cold War buildup; all the graduates became commissioned officers.

The Aviation Cadet Program cast a long shadow on the officer corps' professional development. Some aviation cadet UPT graduates from FY1955, when aviation cadets were still the majority of graduates, could reasonably expect to be promoted through the ranks to general officer and could as general officers serve up to 35 years on active duty. Consequently, some of these aviation cadets could serve through FY1990, and aviation cadet graduates from the last pilot aviation cadet classes in FY1962, upon making general officer, could serve at a maximum to FY1997.

One could use 20 years of service as the earliest point these former aviation cadets could become colonels as a rough guideline to establish when these officers began to become senior leaders in the Air Force officer corps. However, it is somewhat pointless to say that the first aviation cadet UPT graduates of the independent Air Force reached colonelcy as early as 1968 since there are actually two major aviation cadet bulges that affected the Air Force officer corps. Chart 8-3 (Comparison Aviation Cadets and Air Force Academy Cadets) provides a graphic representation of the bulge of former-aviation-cadet officers that made its way through the independent Air Force's officer corps in comparison with the growth of the Air Force Academy cadets. This bulge conceivably had effects for up to 35 years. However, the bulge in the 1950s pales

Chart 8-3: Comparison Aviation Cadets and Air Force Academy Cadets

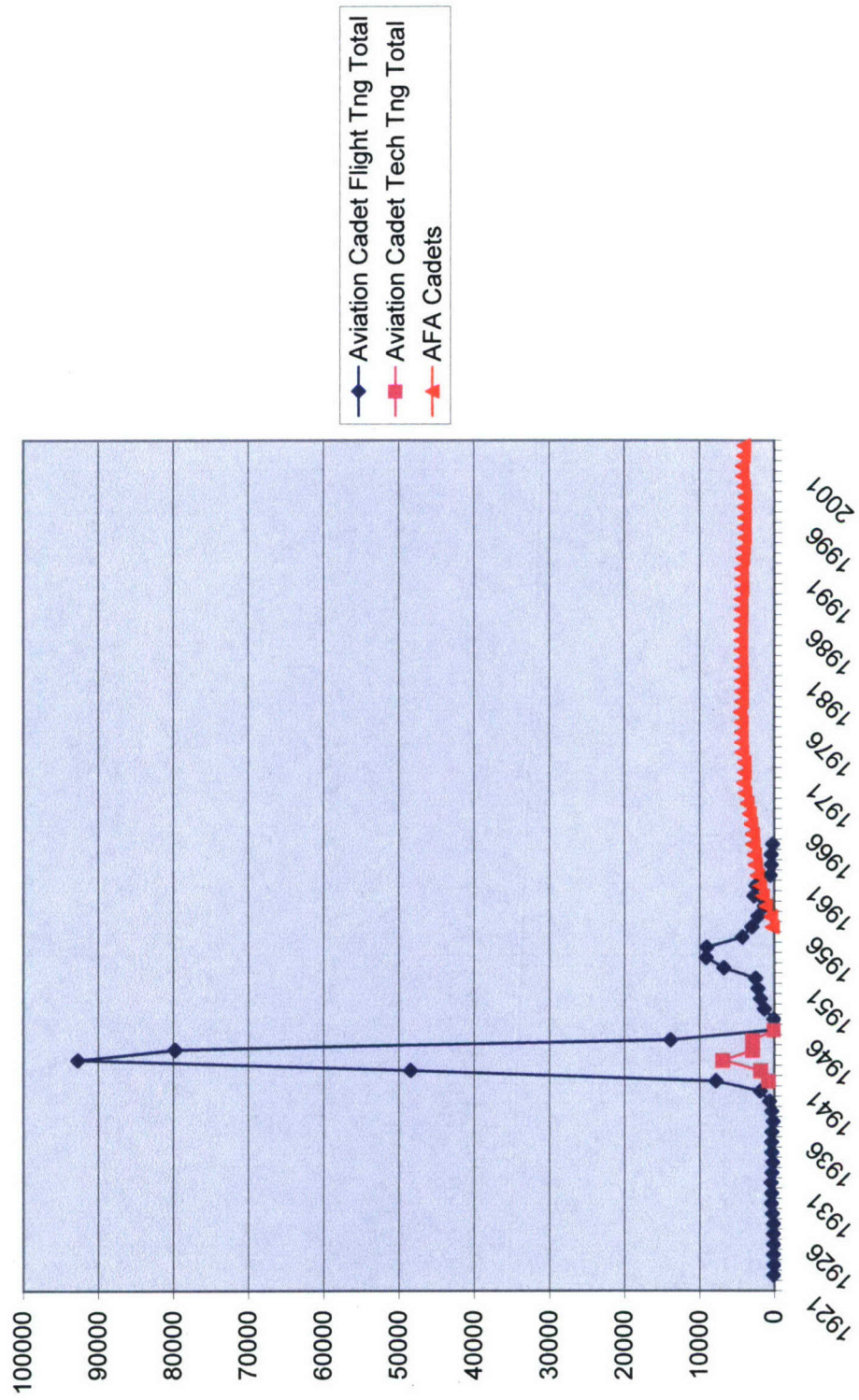




in comparison to the World War II bulge, which is shown in Chart 8-4 (Comparison Aviation Cadets and Air Force Academy Cadets 1922-2003). This World War II bulge began to fill the Air Force's senior ranks by the early 1960s with pilots who had served as junior officers in World War II. The youngest of these officers, who upon making general officer rank could serve to a maximum of 35 years, conceivably remained in senior leadership positions until approximately FY1980.

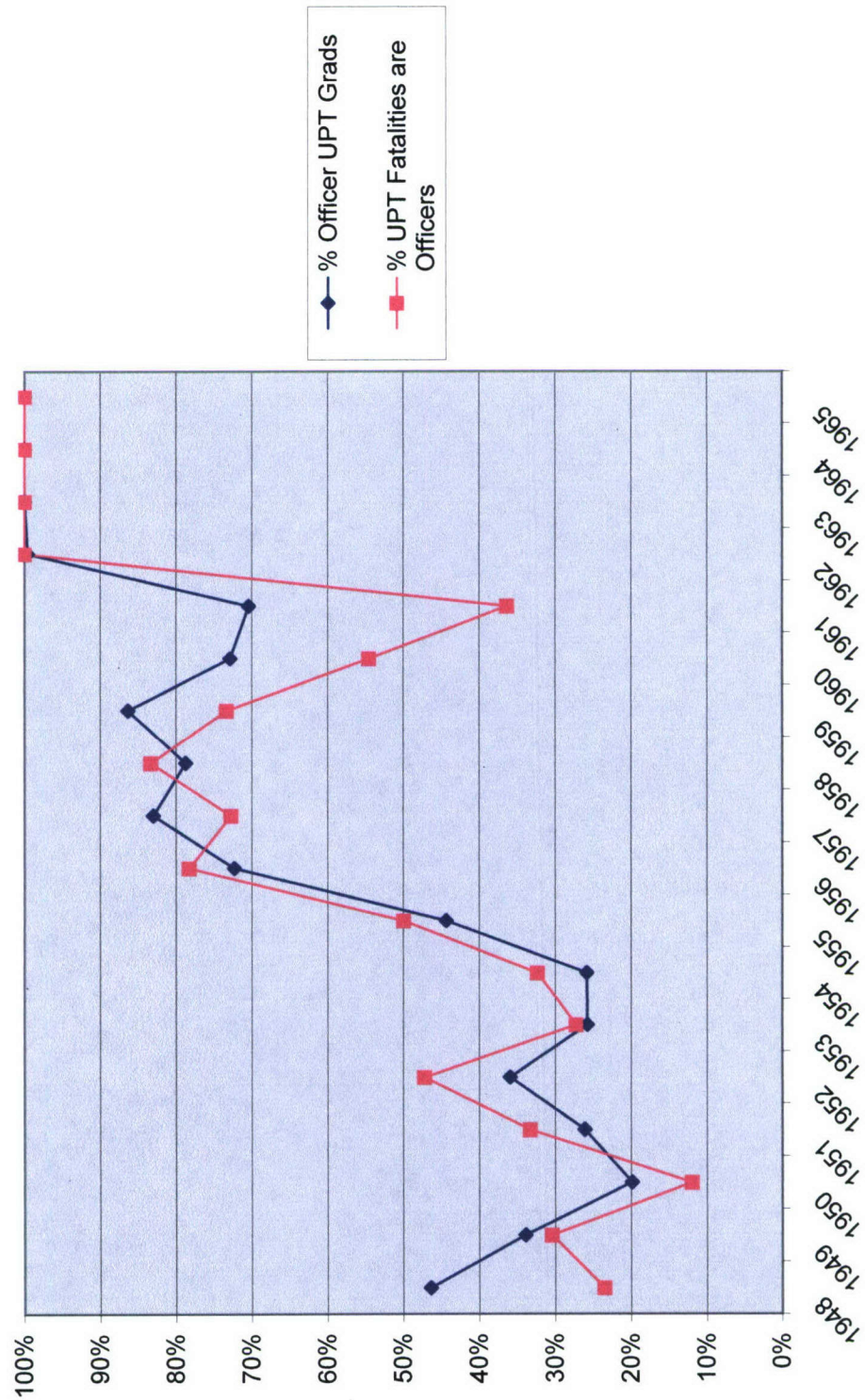
This led to the perplexing professional problem that the leadership of the Air Force, which prided itself on being the most technological of the armed services, was transitioning to a group of relatively uneducated general officers and colonels. This would make it difficult to convincingly sell the Air Force officer corps as masters of technology before Congress and the public. The military service with the nation's ICBM force, the lead in military space activities, and large investments in C4ISR as well as very sophisticated aircraft, could not claim to run everything with a single management tool based on seat-of-the-pants flying experience. In fact, over 20% of the general officers and over 35% of the colonels did not have bachelor degrees in 1966 and in 1969. Part of the problem was that the aviation cadet program was based on the idea that a college education does not contribute to a person's ability to learn to fly. In fact, the percent of officer and aviation cadet UPT fatalities roughly mirrored the percentages of officer and aviation cadet graduates in the experience of the independent Air Force. See Chart 8-5 (Percent Officer Student-Graduates for Pilot (UPT) Training versus Percent UPT Fatalities are Officers (Rest are Aviation Cadets) FY1948-FY1965). From

**Chart 8-4: Comparison Aviation Cadets and Air Force Academy Cadets  
1922-2003**





**Chart 8-5: Percent Officer Student-Graduates for Pilot (UPT) Training versus  
Percent UPT Fatalities are Officers (Rest are Aviation Cadets) FY1948-FY1965**



FY1949 through FY1959 there was no evidence suggesting that officer pilot trainees with college degrees were dramatically safer than aviation cadets, in terms of fatalities.<sup>243</sup> Of course, the real issue was not whether 18 and 19 year-olds or college educated officers made better pilots. The issue concerned the linkage of piloting to commissioned status. The Air Force needed pilots, but it also needed officers.

If a college education was immaterial to pilot training success, piloting did not appear to fit into the general bailiwick of a professional expertise as defined by Huntington and others. Instead of a liberal arts college education forming the foundation, upon which professional education rests, piloting would be seen largely as a physical or athletic-type technical skill. In addition, pilot training was obviously not an exclusive jurisdiction of the Air Force officer corps. After all, initial training and initial flying training/screening had been performed by civilian contractors for the Air Force. Furthermore, even if piloting was indeed a trade skill and a bachelor's degree did not help, the fact that only pilots could command flying and important non-flying units meant that Air Force officer corps was building itself a pool of future uneducated commanders. To further complicate issues, the draft brought more college-educated officers into the Air Force in non-flying positions, leading to a potential imbalance of

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<sup>243</sup> The FY1960 and FY1961 portions of the graph are based on a low population with the ensuing problem of potentially wild percentage swings from year to year. For example, there were a total of 11 UPT fatalities per year in FY1960 and FY1961; so a single death would affect the graph by 9%, and if the category of one fatality was changed, the losing category would decrease by 9% and the gaining category would increase by 9%. Total UPT fatalities were well above 20 per year from FY1949 through FY1957, peaking in FY1953 at 66 fatalities. From FY1958 through FY1960 there is a gradual decrease in UPT fatalities from 18 to 11.



well-educated junior officers being led by minimally educated, but pilot, senior officers. One can argue that education does not make the man, but this argument runs contrary to the generally accepted Huntington perspective on officership. In addition, the argument runs against General Patrick's assessment that a college education was indeed an indicator of officer caliber material. The extra four years of maturity and broader intellectual exposure may not improve hand-eye coordination, but they may improve critical thinking, problem solving skills and leadership abilities. In General Patrick's day, it was clear that being a pilot did not equate to being an officer or having any particular leadership skills. Not all officers were pilots, and obviously not all pilots had those somewhat intangible characteristics required of officers. The Army Air Forces of World War II through 1947 also clearly made that distinction, with the flight officers and enlisted pilots embodying the fact that piloting did not equate to commissioned officership. The independent Air Force officer corps' continued reliance on the Aviation Cadet Program indicated a belief that piloting skills directly correlated with officership skills.

Graduates from the aviation and flying cadet programs would appear to be the epitome of the Air Force's heroic warrior archetype. Aviation cadets were not required to have college degrees, and although some did, many entered aviation cadet training with just a high school diploma or perhaps with some college coursework. For an aviation cadet graduate, flying was in many ways the measure of all things. He enlisted in the aviation cadet program in order to learn to fly. Aviation cadets who failed pilot

training were in a sense punished because they reverted to enlisted status in the Air Force.<sup>244</sup> Flying ability was the sole criteria for the decision between becoming an officer or enlisted man in the Air Force. Successful completion of flying training, i.e., pilot wings, not a degree or service academy program, was their qualification for an officer's commission. Educational background, experience, and leadership skills were immaterial in defining an aviation cadet's fate. Once commissioned, it was clear that rated officers were given preferences over non-rated officers for regular commissions. They were paid more as long as they continued to fly, and they usually stayed in the Air Force longer. This paradigm could not help but be at least partially subsumed into the officer corps' concept of membership, and particularly of its concept of who formed the membership core. Just as his pilot rating made an aviation cadet an officer, a pilot rating made the officer eligible for command, and eligibility for command made the pilot officer eligible for pre-command jobs, which were in turn more promotable positions with more responsibility. A pilot's rating was the key to opening doors as the officer progressed through the system. The Aviation Cadet Program was the vestige of a world in which 90% of Air Force officers should be pilots.

The Aviation Cadet Program might have been a relatively simple way to provide the Air Force with a large pool of pilots and navigators, but it did not necessarily provide the Air Force officer corps with the best mix of academic backgrounds and life

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<sup>244</sup> A caveat of the aviation cadet program was that aviation cadets were formally enlisted in the Air Force and faced the prospect of serving an enlisted tour if they washed out of pilot or navigator training and were still physically qualified for military service.



experiences that could translate into the leadership qualities that the officer corps needed to run the independent Air Force and successfully compete against other professions for jurisdictions. Flying was obviously important to the Air Force, but things like radar, electronic warfare, guided air-to-surface bombs, cruise missiles, medium-range ballistic missiles, and the atomic bomb were all used operationally during World War II. The basic tools for building an air force devoid of piloted aircraft, or for building an independent *ether* force, were already present. The Air Force officer corps needed pilots and navigators, but it also needed men with vision—and a vision to take the officer corps beyond the belief that strategic bombing was the foundation of an independent air force.

In order to ensure a pool of quality officers available for selection to its most senior ranks, the officer corps could have raised the academic standards required of aviation cadets. The officer corps might have also changed the law restricting command of flying units to pilots because the implementation of the law resulted in a general skewing of promotable billets to pilots.<sup>245</sup> However, the history of the struggle for independence precluded the option of letting non-pilots command flying units or exercise responsibility and decision-making in any operational, and therefore, key membership positions. However, since the majority of pilots came from an aviation cadet background, over the long run, West Point graduates would not likely retain the

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<sup>245</sup> In order to prepare pilot officers for more senior positions, and because pilots were seen as the only officers who routinely faced responsibility (for their aircraft and crew) and decision-making under stressful conditions (flying the aircraft), pilots were the preferred, if not required, candidates for all billets of responsibility and decision-making.

top leadership positions. Furthermore, the independent Air Force officer corps would never reach its full potential if its most educated and most rounded members continued to be initially shaped by an Army institution.

The Air Force officer corps needed its own service academy, and giving up the aviation cadet program was part of the price of professionalization. An Air Force Academy would allow the Air Force officer corps to take the best of the aviation cadet candidates and educate them in a total Air Force environment.<sup>246</sup> They would be exposed to the traditional academy mix of a heavy emphasis on engineering with some rounding liberal arts course work. The cadets would graduate with a Bachelor of Science degree and a firm grounding in airpower, before being sent to pilot training.<sup>247</sup> This would help establish Air Force flying and the exercise of airpower as an intellectual or mental expertise, not merely an athletic skill. Simultaneously, it would lend credibility to the Air Force officer corps' claims for jurisdiction in the fields of developing and applying state-of-the-art technology affecting air, space, and communications. After a generation, the officer corps' senior professionals would be at least as academically credentialed as the junior officers they led. Air Force general officers would not have to rely on a stratum of technical advisors. The generals themselves would have some understanding of technical and other non-flying issues for which they assumed responsibility. An academy was not all positive, however, for it

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<sup>246</sup> The Air Force Academy admitted 306 cadets into its first class in 1955; 207 graduated in 1959.

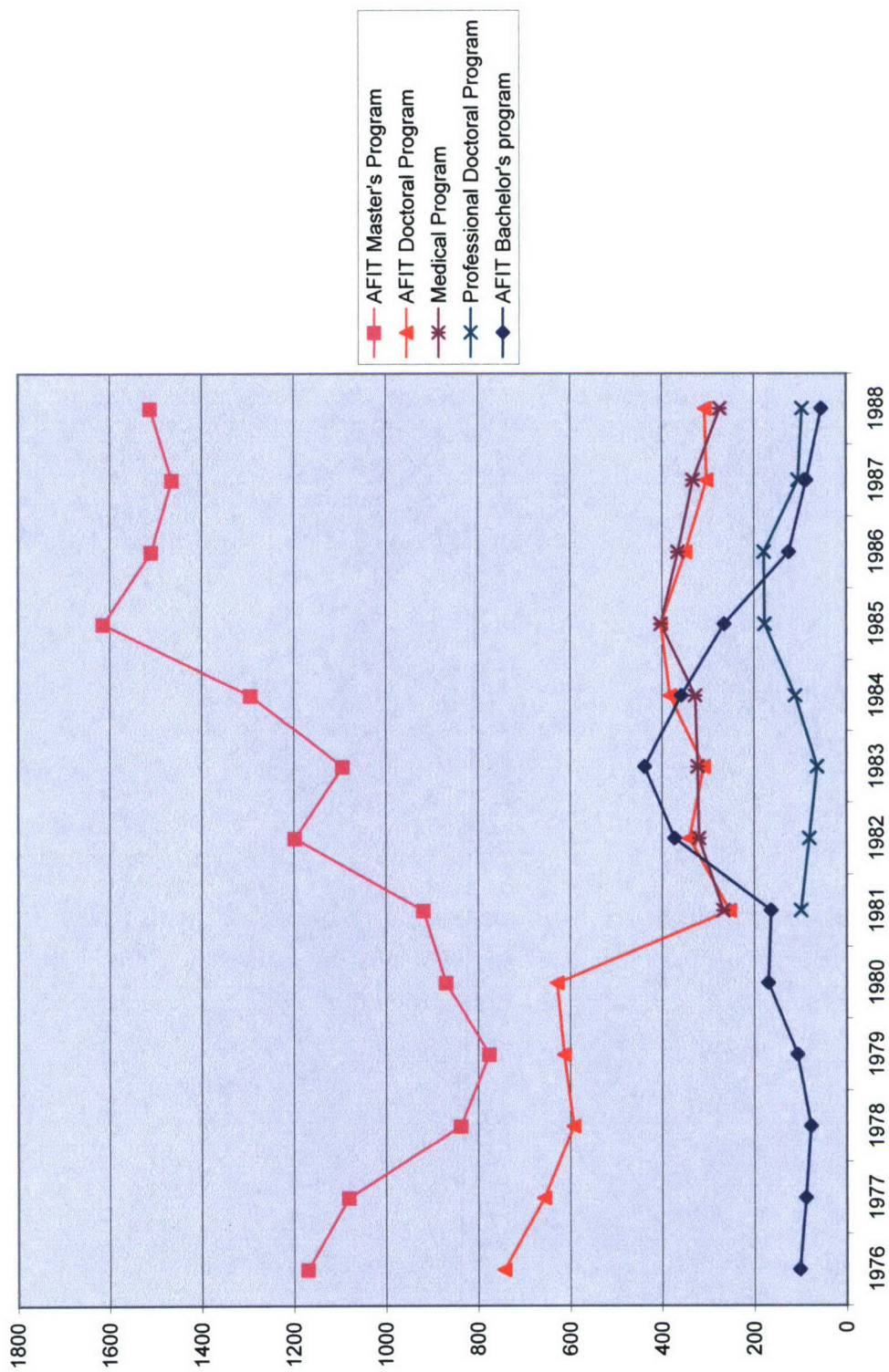
<sup>247</sup> The Air Force Academy's engineering emphasis, which is similar to that of the other American service academies, is another area of deviation from Huntington's concept that the undergraduate degree should be broad and in the liberal arts, with professional knowledge being added later.



meant a fixed number of graduates per year, without the Aviation Cadet Program's ability to ramp up pilot training quotas. This in turn meant a more even distribution of pilot training slots between the remaining commissioning sources. Nevertheless, pilots, and presumably Air Force Academy graduate pilots in particular, would still provide the core of the profession's senior leadership. In the meantime, the officer corps began to stress the importance of academic degrees.

Since the Air Force Reserve Officer Training Corps (AFROTC) program and the academies only produced officers with bachelor degrees, the Officer Training School (OTS) was the last major source of commissioning outside of the Aviation Cadet Program allowing non-degreed people to become officers. However, OTS was already being indirectly helped by the draft from the Korean War through the end of the Vietnam War. A voluntary tour in a non-flying, non-combat position in the Air Force was seen by many young men as preferable to a tour in the Army. Consequently, the Air Force could be more selective in its OTS candidates. The phasing out of the aviation cadet program led to a steady fall in the percentage of officers without a bachelor degree. In the intermediate ranks, the Air Force encouraged officers to earn college degrees, both at the bachelors and graduate levels. In fact, the Air Force would pay for officers to go to college. For example, Chart 8-6 (AFIT Funded Officer Education Programs (1976-1988)) provides a snapshot of the number of officers participating in these programs from FY1976 to FY1988. Although the master degree programs had the most participants, the Air Force was paying for 438 officers to earn

Chart 8-6: Air Force Institute of Technology (AFIT) Funded Officer Education Programs  
(1976-1988)





bachelor degrees at the end of FY1983. Finally, officers' academic credentials appeared to play a role in promotion selections. From the mid-1960s onward, Air Force reporting of promotion board results often included statistics on the academic credentials of the newly selected promotees, directly stressing the importance of degrees in the promotion process.<sup>248</sup> The initial emphasis was on general officer promotions and possession of bachelor degrees, but the focus gradually worked its way down through the field grade ranks, while simultaneously shifting to the possession of masters degrees as the initial trough of all degreed officers reached consideration for major in the mid-1970s. By the early 1980s, a master's degree was generally considered a prerequisite for promotion to major.<sup>249</sup>

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<sup>248</sup> For example of a random report on promotions, an Air Force Times reported in the mid-1960s: "Among the BG selectees,...fifteen hold bachelors degrees, three masters degrees, one is a Ph.D., another a dentist and 14 are not college graduates. Six others are Academy graduates, and one is an academy graduate with an M.A. Most are pilots (35), one is double-rated as a pilot-navigator, another is a navigator and three are non-rated." See Nick Sivulich, "Forty Colonels, 15 BGs Named for Promotions," Air Force Times 18 Aug 1966: 1, 10. "That education was a significant factor in the selection is demonstrated by the fact that 20 percent of those eligibles holding master's degrees and PhDs were named for advancement. Only eight percent of those with 'some college' and seven percent of those with no college were picked. Among secondary zone [below-the-zone, i.e., those chosen early for promotion] selectees, 86 of the 101 selectees are college grads. Forth-nine hold masters; two are PhDs. Only two have no college. Thirteen have 'some college.'" See "745 Named Temporary Colonels," Air Force Times 7 Oct 1970: 1, 26.

<sup>249</sup> This "requirement" led to a generally acknowledged "square-filling" exercise as company-grade officers struggled in their off-duty time to get any sort of masters in any field from any college before hitting the promotion board for major. The Air Force decided in 1988 to stop unit commanders from taking off-duty civilian education into consideration for promotion recommendations. However, civilian education was still listed in the officers' records at the central promotion board. The policy was reversed in 1995. Unit commanders were allowed to take civilian education into account (since many were doing it anyway) and it stayed in the promotion records. See Andrew Compart, "Officer system will undergo major changes," Air Force Times 27 Mar 1995: 3. In 1995 the Air Force removed all references to off-duty civilian education from officer promotion records for promotion to captain and major, but retained it for promotion to lieutenant colonel and colonel. The justification was that not all junior officers had the same opportunity to earn off-duty degrees; while lieutenant colonels, colonels and general officers "require the maturity and exposure provided by advanced studies." There was some question as to

Chart 8-7 (Comparison of General and Field Grade Officer Post-Grad or Professional Degree Levels by Percent) captures the essence of this transition in the officer corps' requirements for both entrance and advancement to mid-level and senior ranks. Until FY1966, when the aviation cadet program ceased to exist and the Air Force finally was able to report that 100% of its OTS candidates possessed at least bachelor degrees, officers, and rated officers in particular, were not required to have bachelor degrees prior to accession. The possession of graduate degrees, with the exception of professional-type degrees for non-line officers, was unusual. Then, within the span of 20 years, possessing a master's degree was generally regarded as a prerequisite for selection to field grade ranks. In Chart 8-8 (Officer Highest Education Level by Percent), the history of the Aviation Cadet Program loosely parallels the decline in officers with less than a bachelor degree. The percent of officers with a

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whether the real driving factor behind the masking of degrees was that larger numbers of pilots were being deployed more frequently and longer than before—and consequently were unable to earn master's degrees—which would put them at a disadvantage to their non-rated colleagues facing the same promotion board. See Bryant Jordan, "Promotion-folder change: Advance degrees lose luster for captains, majors," *Air Force Times* 15 Jan 1996: 10. By 1999 it was clear that the promotion boards were not just using master's degrees and PME completion as tie breakers, but as promotion criteria. Officers with "definite promote" recommendations, which were limited to a small percentage of the officers being considered for promotion, were not being promoted because they either did not have advanced degrees or had not completed the normal level of PME for their rank. See Bryant Jordan, "Education no longer make-or-break criterion for promotion: Ops temp prevented officers from getting degrees and PME," *Air Force Times* 6 Sep 1999: 10. In February 2005 the Air Force finally eliminated all references to off-duty civilian education from officer promotion records to all grades, ostensibly because the boards gave too much weight to having, or not having a master's degree, and not enough to whether it was useful to the officer or to the Air Force. See Rod Hafemeister, "A new degree of anonymity: Civilian education to be hidden from promotion boards," *Air Force Times* 14 Feb 2005: 13. However, the Air Force quickly reversed that policy, announcing in April 2006 that officer civilian education will once again be part of the promotion records starting in January 2008. Apparently too many officers stopped pursuing academic degrees on their off-duty time, and those that did wanted credit for it. See Rod Hafemeister, "Officers: Your civilian education is showing," *Air Force Times* 1 May 2006: 10. Square-filling prevails.



**Chart 8-7: Comparison of General and Field Grade Officer Post-Grad or Professional Degree Levels by Percent**

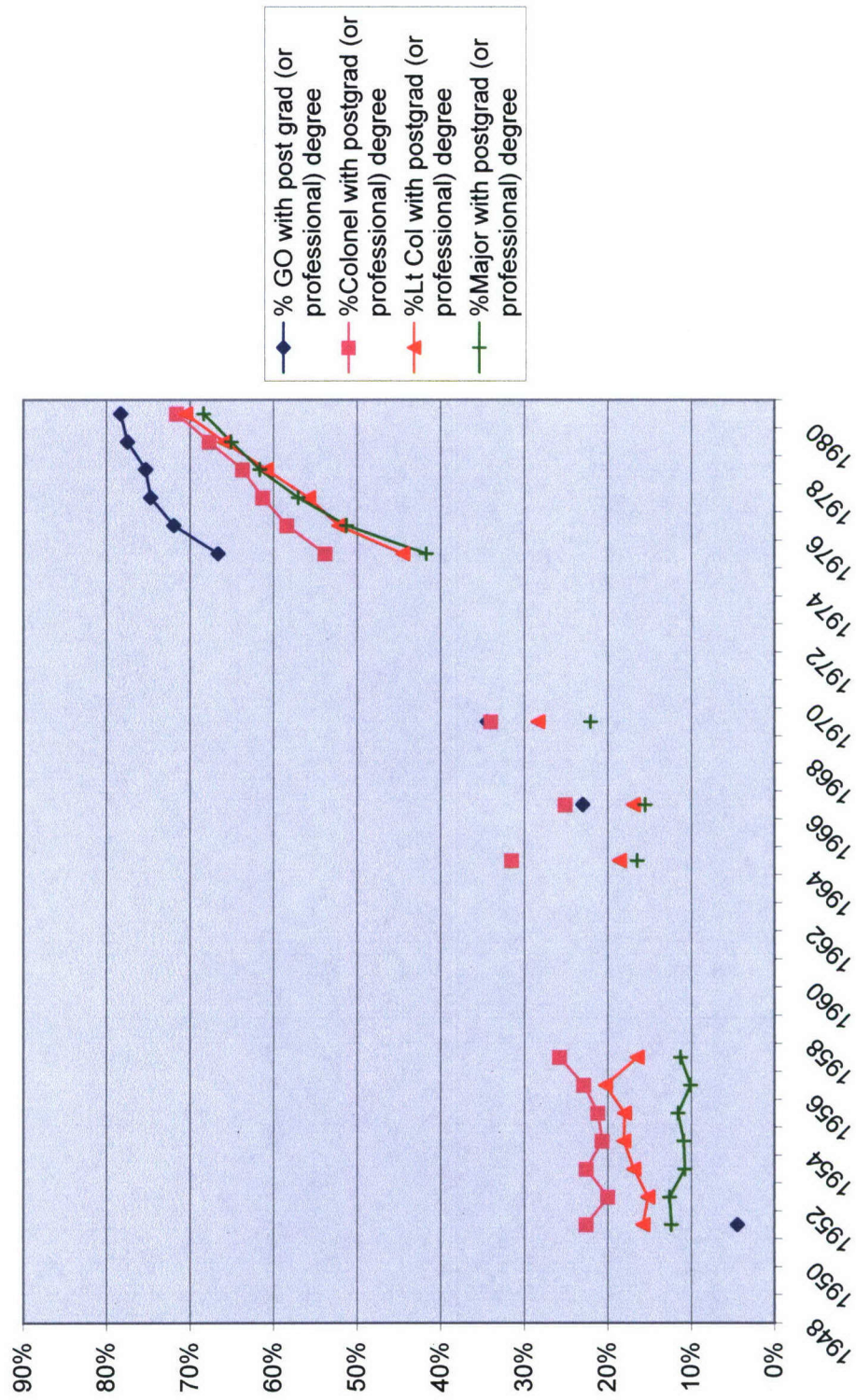
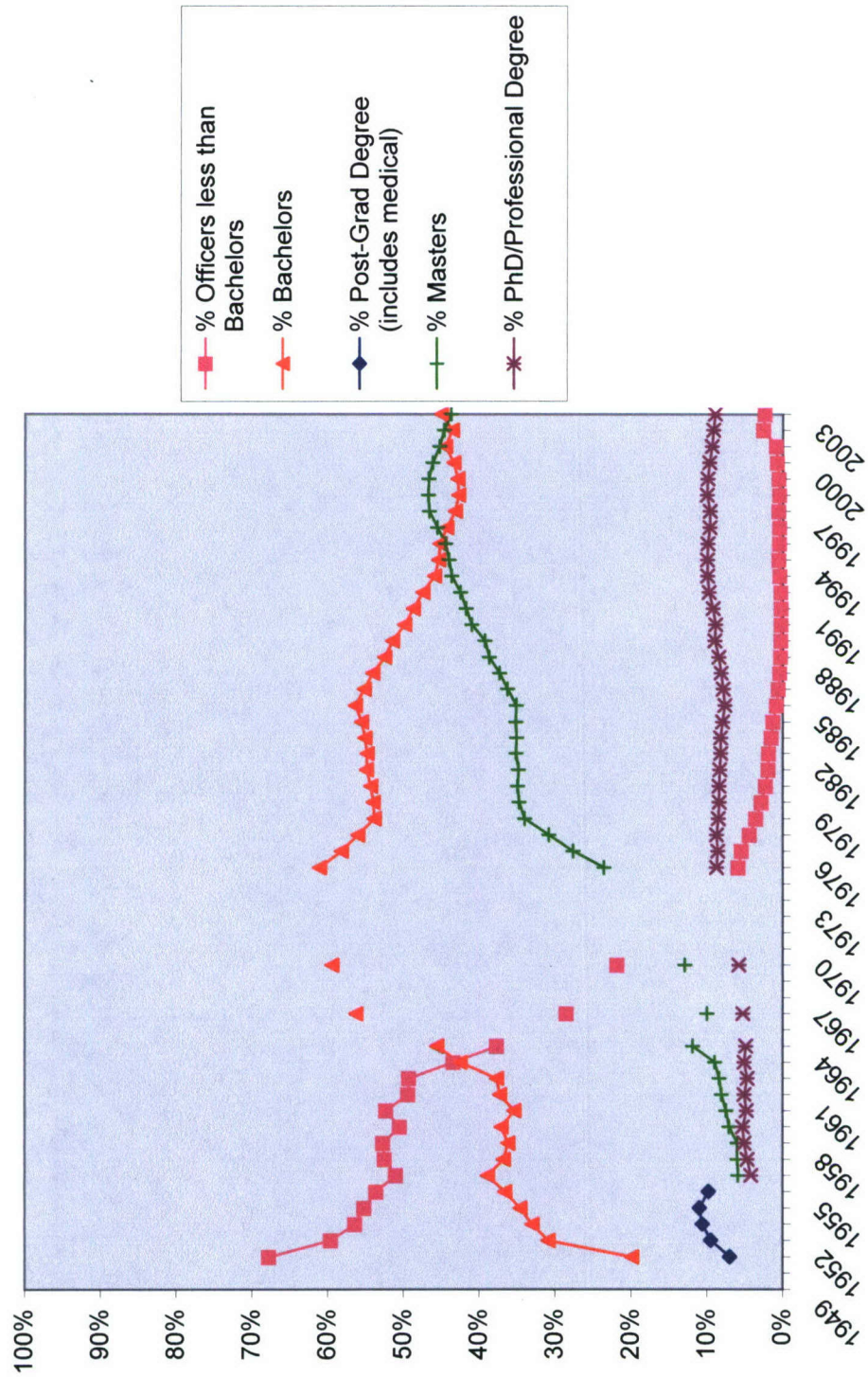


Chart 8-8: Officer Highest Education Level by Percent





bachelor degree captures the shift to the requirement for a bachelor degree at accession into the officer corps. The rise in the number of officers with master's degrees indicates the informal requirement for a master's degree to be promoted to field grade rank, and the PhD/Professional degreed officers generally captures the non-line officers.<sup>250</sup> As a general rule, line field grade officers are expected to have a master's degree, but not a PhD since a doctorate signifies an investment of too much time in things academic, and not enough in things flying, operational, or supporting these endeavors. The profession prides itself on the high percentages of officers with advanced degrees. In theory, this means that pilots are now generally well-educated, technically astute, and therefore capable of commanding and serving in a variety of non-flying billets without the need for specialist or technical advisors. Of course, the non-flying officers are at least equally qualified in non-flying issues.

The general officer sample data reflects the impact of the Aviation Cadet Program as well as the major changes in the sources of general officers' commissions across the sampling period. The initial Air Force line general officer corps was marked by the recruitment policies and programs in effect during the inner war years and World War II. The two major sources of officer commissions were the US Military Academy at West Point and the Aviation Cadet Program. These two sources still provided over 50% of the Air Force line general officers in the 1978 sample, and 47% in the 1983

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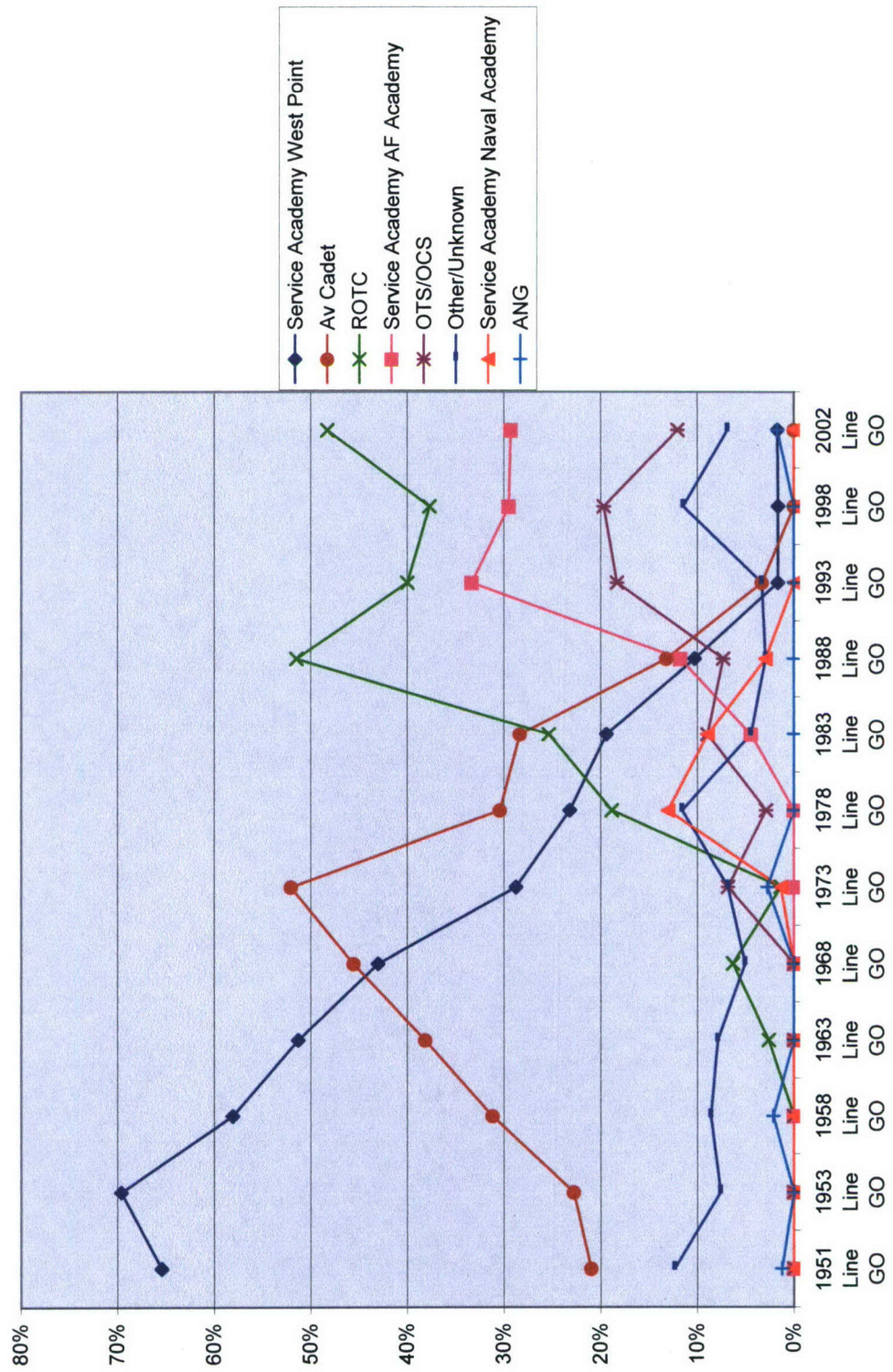
<sup>250</sup> There are of course exceptions in this generalization. Nurses without graduate degrees, for example fall under the officers with bachelor degree category, and officers with PhDs serving at the Air Force Academy for example are usually still line officers of company or field grade rank.

sample, which is a testament to the long shadow of these two programs on the leadership of the Air Force officer corps. See Chart 8-9 (GO Samples: Total Line General Officer Source of Commission by Percent).

The changing nature of general officer commissions represents a lag effect of officer recruitment policies, but it also reflects changes in the professional perspective of the officer corps. Take the West Point graduates for example. In the 1951 sample 65% of the line general officer corps was composed of West Point graduates. This figure increased to 70% in the 1953 sample, then began a steady decrease through the 1993 sample, where it leveled out at 2% through the 2002 sample. In the 1968 sample, West Pointers still comprised 43% of the line general officer corps. Although probably no less avid aviators than officers from other commissioning sources, West Pointers possessed bachelor degrees, had obvious ties to the Army and Army traditions, and often had served initially in non-Air Corps assignments within the Army. Consequently, they had in many ways broader horizons and experiences than their contemporaries, the majority of whom were commissioned through the aviation cadet program. That is not to say that West Pointers were not heroic warriors. However, the visionary nature of their broader experiences and preparation was clearly accorded great status within the profession since they were so over proportionally represented in the general officer ranks. For example, in the 1958 sample, West Point graduates comprised 58% of the line general officer corps. However, the percentage of West



Chart 8-9: GO Samples: Total Line General Officer Source of Commission by Percent



Point graduates in the total Air Force officer corps was only 3%.<sup>251</sup> With only a fraction of hundreds of West Point graduates annually going into the Air Corps, Army Air Forces, and independent Air Force but over 90,000 aviation cadets in training at the end of FY1943 and over 9,000 aviation cadets in training at the end of FY1953, West Pointers were clearly in the minority from World War II onwards. Nevertheless, they dominated the general officer ranks because they had formed the leadership core of the interwar Air Corps and because the profession valued their non-flying attributes. The West Pointers formed the inner core of the profession and continued to hold key positions long after the ascendancy of the former aviation cadets. Graduates from the aviation cadet programs only comprised 21% of the 1951 line general officer sample, but the percentage climbed steadily until peaking at 52% in the 1973 sample, followed by a fairly constant decline with the last aviation cadet graduates being reported in the 1993 sample.

The line general officer sample data provides an opportunity to examine differences between West Pointers and former aviation cadets at the 4-star and 1-3 star general officer levels, although it is difficult to draw too many conclusions on differences between 4-star and 1-3 star general officers in the earlier samples. Although the percent of unknown or other sources of commission for the 1-3 star general officer data fluctuates between 3% and 12 % per sample, the small sizes of the 4-star general

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<sup>251</sup> Although the 3% figure is based on the percentage of West Point graduates from the *total* Air Force officer corps, adjusting for line officers only has minimal impact and affects it by one percent at most.



officer samples are so small that two unknown/other entries account for 29% or 25% of the 1951 and 1953 samples. See Chart 8-10 (GO Samples: General versus 1-3 Star General Officers – Source Commission – Unknown/Other). Furthermore, even when the number of unknown/others drops to one or zero, as it does from 1958 through 2002, there appears to be a high degree of fluctuation with respect to 4-star general officer's sources of commission. In some ways it seems to symbolize a great struggle between the more visionary West Pointers and the more heroic warrior aviation cadet graduates—except for the critical fact that West Point graduates were such a small part of the officer corps. See Chart 8-11 (GO Samples: General versus 1-3 Star General Officers – Source Commission – Service Academy West Point). The peaks for the 1968 and 1983 samples are real since there are no unknown/others in those samples at the 4-star general officer level, and switching all the unknowns to West Pointers would raise the valleys, but not eliminate them. The same holds for aviation cadet graduates. See Chart 8-12 (GO Samples: General versus 1-3 Star General Officers – Source Commission – Aviation Cadet). In the aviation cadet case, the valleys in 1968 and 1983 are real, and the offsetting data points in 1973, 1978 and the 1988 samples already account for over half of these 4-star samples without trying to incorporate the unknown/others.

Consequently, the sample data indicates that both the fateful 1974 decision to press for legislation that opened command of flying units to any line Air Force officer and the transition to the flying gate system occurred at a time when aviation cadet

Chart 8-10: GO Samples: General versus 1-3 Star General Officers -- Source Commission --  
Unknown/Other

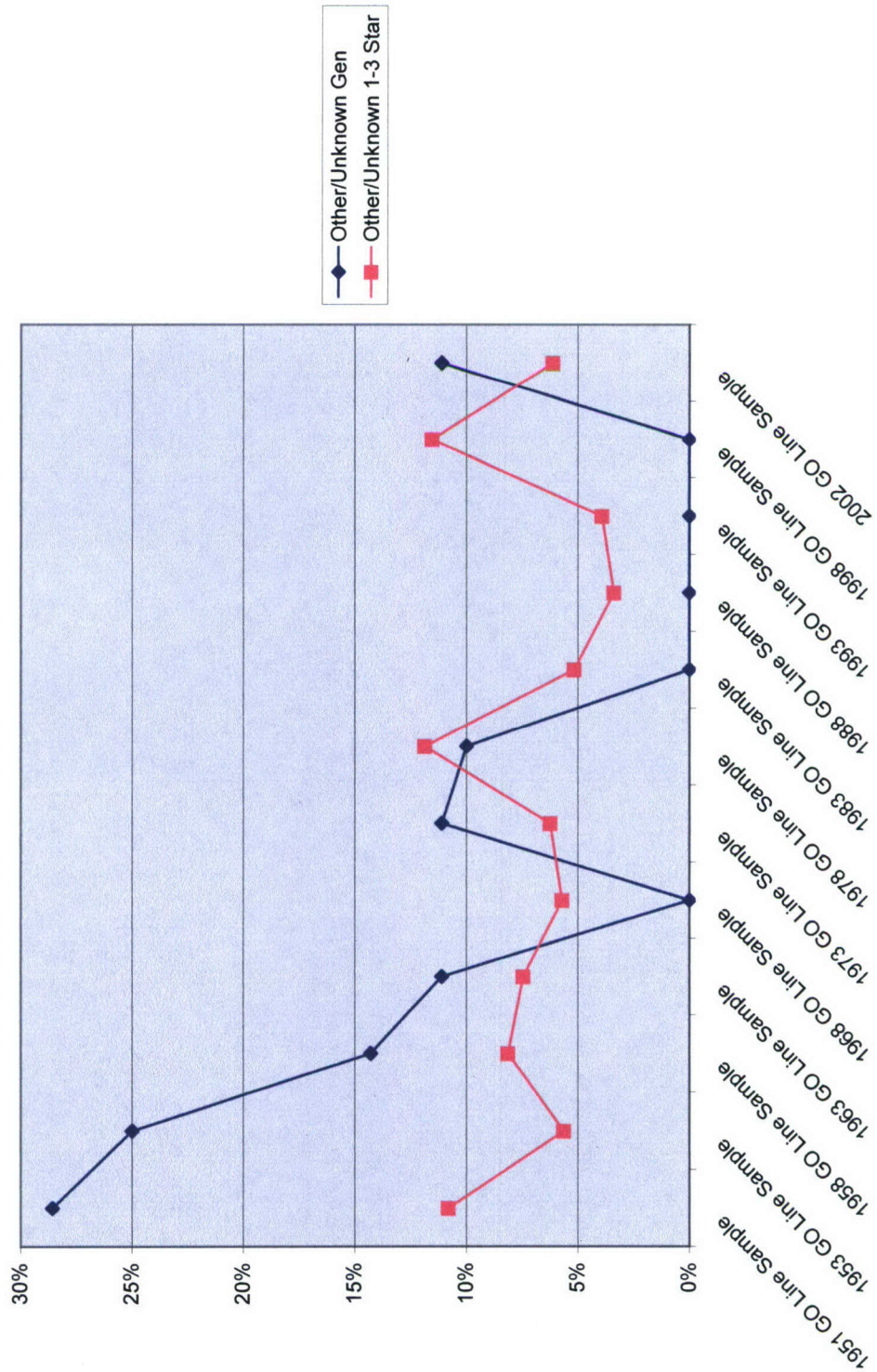




Chart 8-11: GO Samples: General versus 1-3 Star General Officers -- Source Commission --  
Service Academy West Point

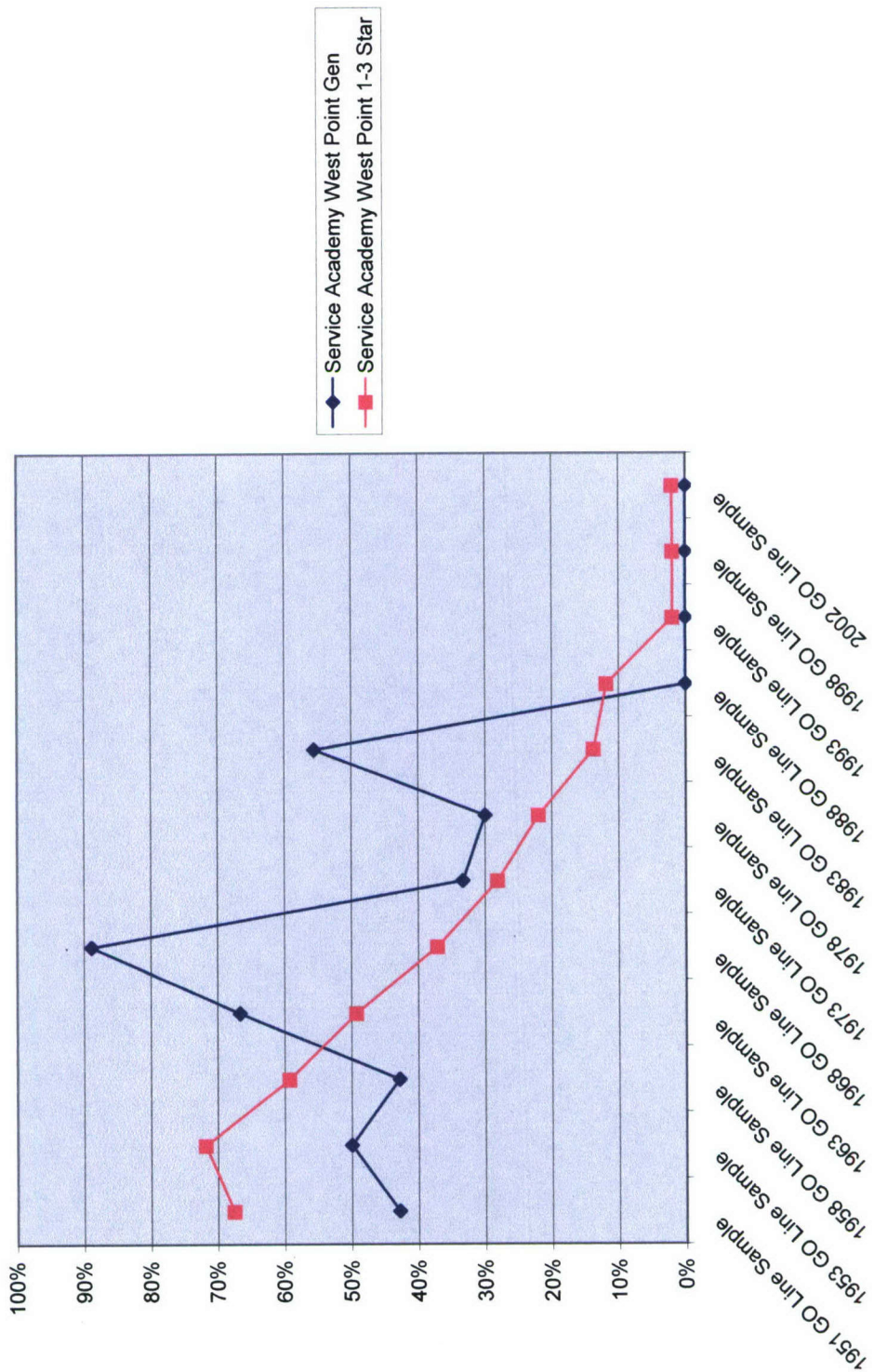
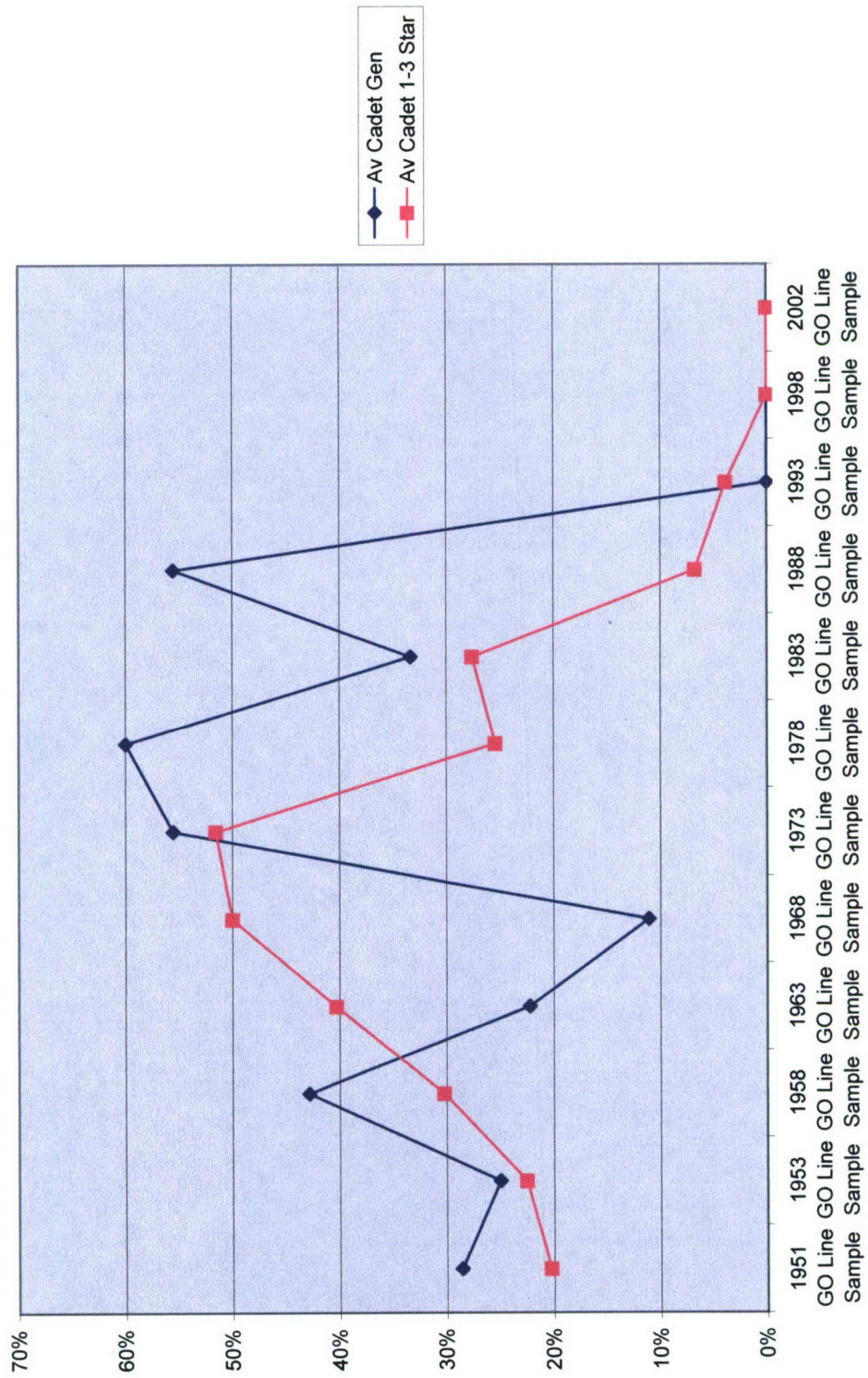


Chart 8-12: GO Samples: General versus 1-3 Star General Officers -- Source Commission -- Aviation Cadet





graduates formed the majority of the 4-star general officer manning. That is, the seemingly more heroic warriors formed the majority within the most senior rank of the profession at a time when it instituted visionary-type policies that over the long-run would increase opportunities for non-pilots to reach general officer ranks. The explanation for this odd observation lies at least partly in the fact that at the time of the decision, former aviation cadets were already on the road to extinction. The program had ended in FY1965. The youngest former aviation cadets were almost majors, and there were no more behind them. The wave of aviation cadet graduates serving as commissioned officers peaked in 1960 when aviation cadet graduates comprised 46% of the total officer corps, and the wave in the 1-3 star line general officer corps peaked in the 1973 sample at just over 50%. The profession had long since decided to change the basis of its membership by eliminating the aviation cadet program, building a separate Air Force service academy, and increasing its reliance on the Air Force ROTC and Officer Training School programs. Modern Air Force officers were required to possess a bachelor's degree before admission to the profession. Flying was no longer the ticket for admission to officer rank and promotion. The profession was more than just flying and needed more than just fliers in the line officer ranks.

By 1978, the composition of the total officer corps had changed to a state where the sources of officer commissions were, in rank-order: Air Force Reserve Officers Training Corps (AFROTC), Officer Candidate School/Officer Training School (OCS/OTS), and the Air Force Academy (AFA). However, from the 1993 sample

onwards, the Air Force general officer corps' primary sources of commissioning were in rank-order AFROTC, AFA and OCS/OTS. Although AFA graduates are over proportionally represented in the general officer ranks, both at the 4-star and 1-3 star general officer levels, they have not achieved the same dominance of their earlier West Point brethren. See Chart 8-13 (GO Samples: General versus 1-3 Star General Officers – Source Commission – Air Force Academy versus Percent Any Service Academy of Total Officer Corps). In fact, the percentage of AFA graduates in the 1-3 star general officers ranks appears to have leveled out at less than 30% from the 1993 sample onwards. Over the same samples at the 4-star level, AFA graduates jumped from zero in 1988 to two-thirds of the sample in 1993, but then dropped in the successive samples to just one-third of the 4-star sample in 2002. When graduates from all three service academies are combined, it is remarkable that from the 1973 sample onwards, despite a bit of a jump in the 1978 data, the percentage of service academy graduates in the 1-3 star general officer ranks appeared to level out close to the 30% mark. Meanwhile, the percentage of service academy graduates in the total officer corps climbed, then leveled out near the 20% mark. See Chart 8-14 (GO Samples: General versus 1-3 Star General Officers – Source Commission – Any Service Academy versus Percentage Any Service Academy of Total Officer Corps). The creation of an independent Air Force Academy resulted in an increase of the overall percent of service academy graduates in the Air Force officer corps to near 20%. However, the over proportion of service academy graduate general officers has decreased from a range of 60%-70% in the 1950s to



Chart 8-13: GO Samples: General versus 1-3 Star General Officers -- Source Commission --  
Air Force Academy versus Percentage Any Service Academy of Total Officer Corps

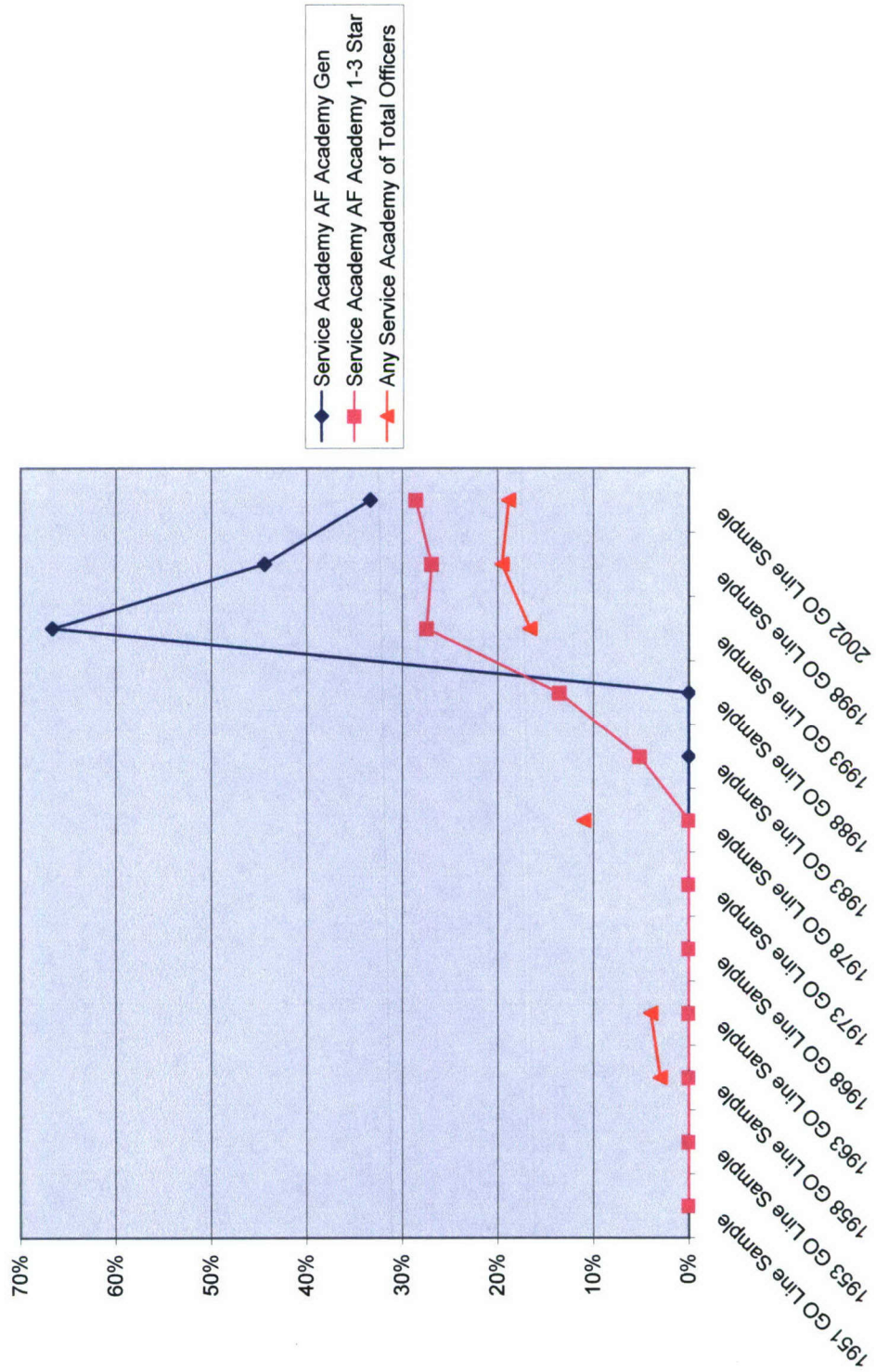
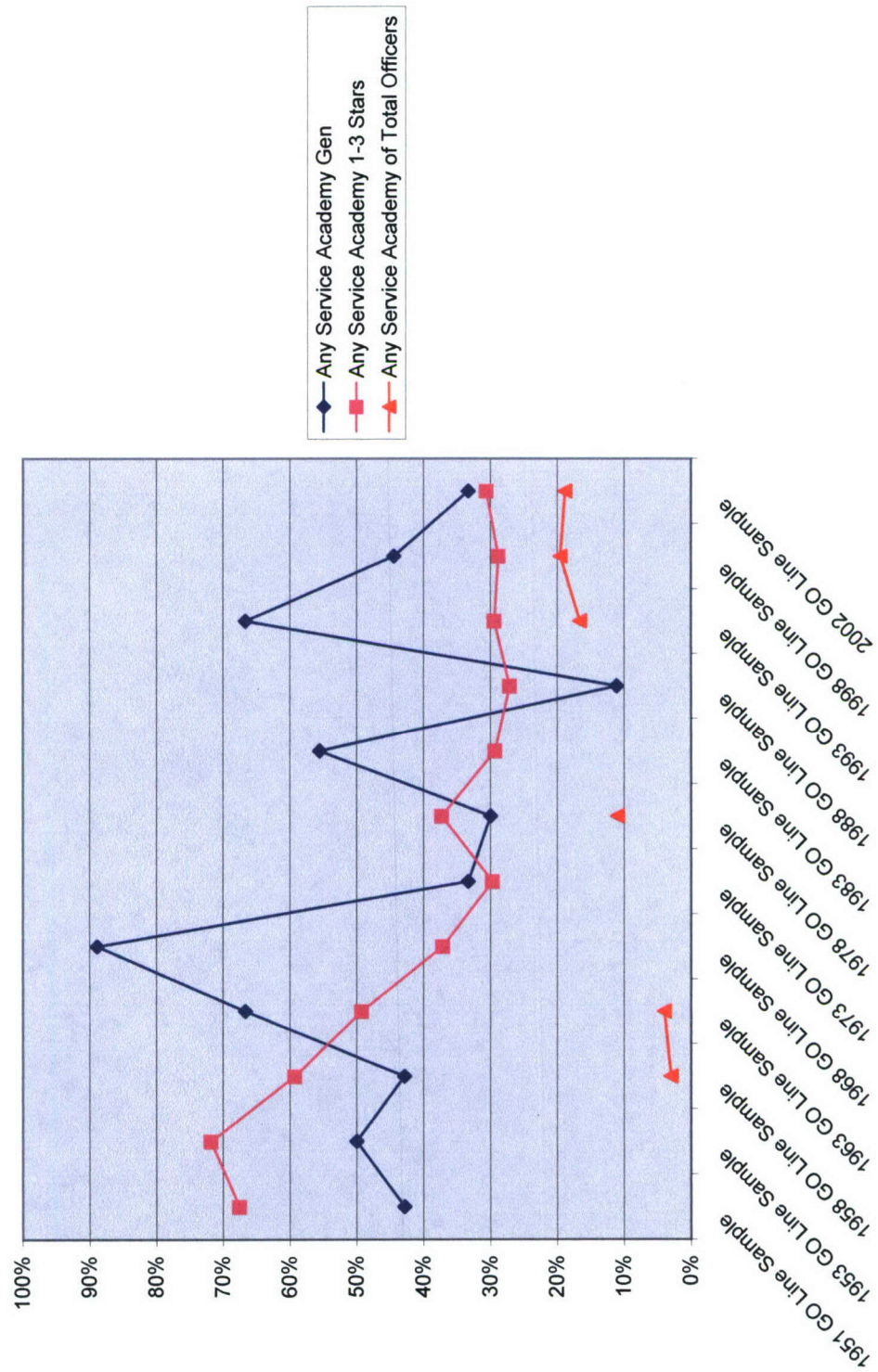


Chart 8-14: GO Samples: General versus 1-3 Star General Officers -- Source Commission --  
Any Service Academy versus Percentage Any Service Academy of Total Officer Corps



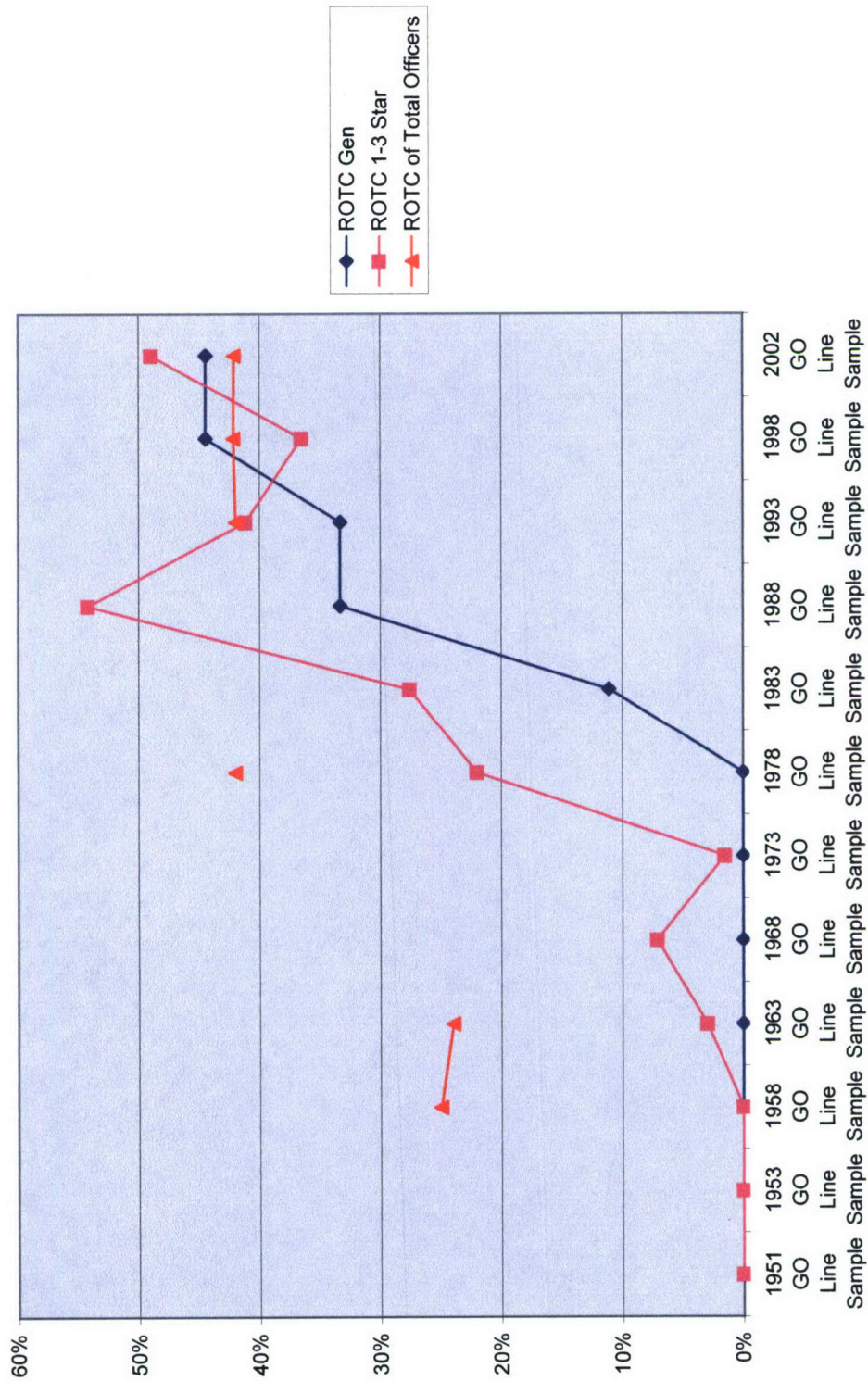


approximately 30% at the turn of the century. And at the most senior leadership level of the profession, the 4-star general officer rank, service academy graduate representation has varied dramatically and erratically across the samples.

Graduation from the Air Force Academy appears to play less of a role in promotion to general officer ranks in the Air Force in contrast to the historic importance of service academy graduation for careers in the Army and Navy. The sheer numbers of aviation cadet graduates, the prohibition of non-pilot command over flying units, and an overall emphasis on piloting minimized the presumed benefits of service academy attendance such as membership in the academy graduate network, and superior academic and professional preparation. The end effect is a more plebian officer corps in the Air Force. Flying skill and status were the great equalizers as well as the key that opened the door for an officer to demonstrate his non-flying organizational and leadership skills in order to rise to positions of authority.

As the number of aviation cadet graduates shrank, AFROTC became the major supplier of Air Force officers. AFROTC graduates also increased dramatically in the general officer ranks. At the 1-3 star general officer level, AFROTC graduate representation climbed from just 2% in the 1973 sample to a peak of 54% in the 1988 sample. See Chart 8-15 (GO Samples: General versus 1-3 Star General Officers – Source Commission – ROTC versus Percentage ROTC of Total Officer Corps). In the 1993, 1998 and 2002 samples, the percentage of AFROTC graduates in the 4-star, 1-3 star, and total officer corps are within 9% or less in each of the samples. This indicates

Chart 8-15: GO Samples: General versus 1-3 Star General Officers -- Source Commission --  
 ROTC versus Percentage ROTC of Total Officer Corps





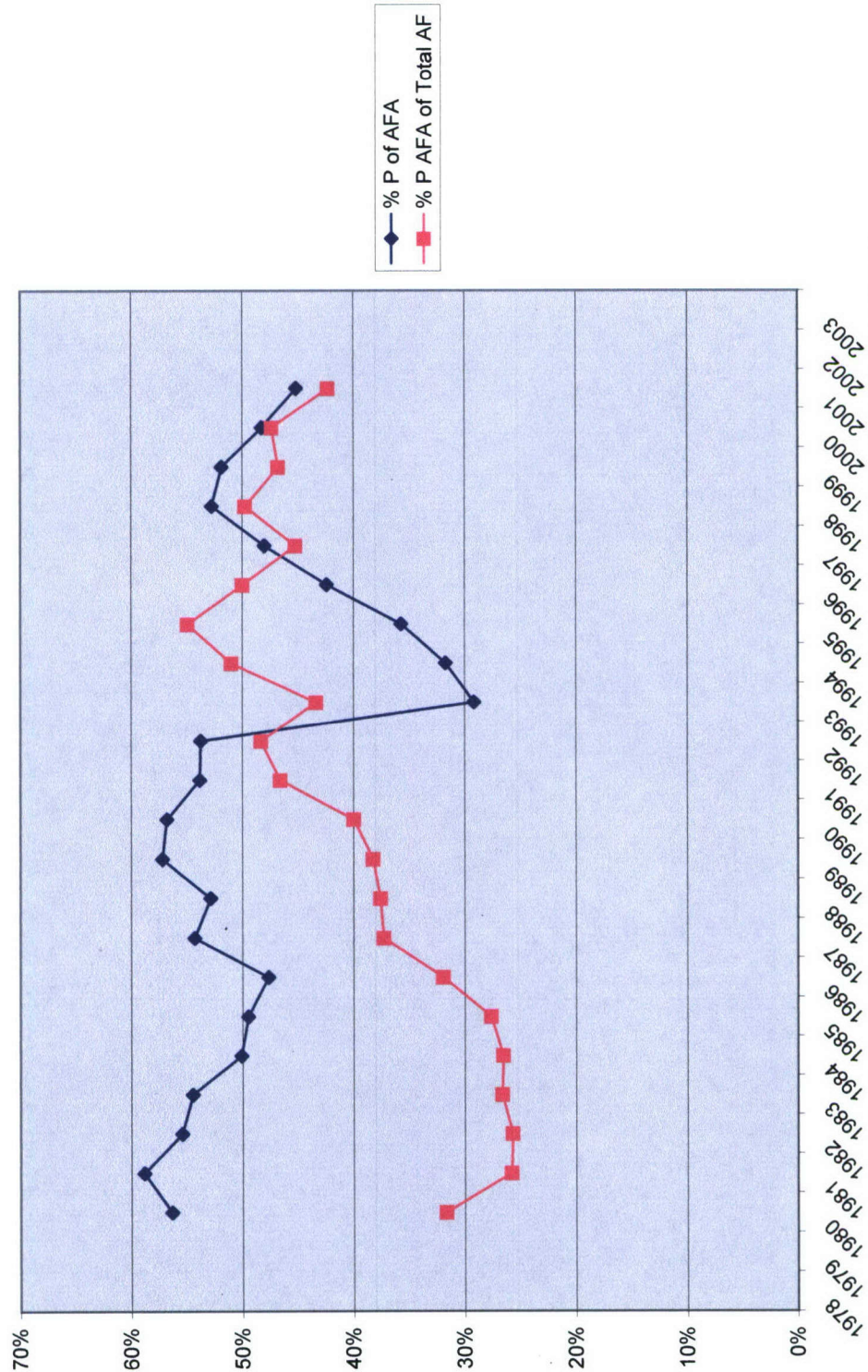
that the distribution of the commissioning sources of the Air Force general officer corps has evolved to where it more generally represents the mix of the total officer corps.

Furthermore, the Air Force Academy has used applicants' physical exam data as part of the selection process to maintain artificially high percentages of pilot-qualified graduates, requires aviation training courses for graduation, and generally caters to a pilot-based Air Force officer corps concept. AFROTC, on the other hand, must provide a wider Air Force perspective to its cadets since flying training activities traditionally occur after graduation and larger percentages of future non-pilot officers reside in the AFROTC corps than in the Air Force Academy. The tradition until 1993 at the Air Force Academy was that if a cadet was medically qualified for pilot training, the cadet would go to pilot training upon graduation.<sup>252</sup> Consequently, in some respects at least,

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<sup>252</sup> During the summer of 1992, the Academy told the classes of 1993, 1994 and 1995 that 100% of the graduating cadets who were pilot qualified would no longer automatically be sent to pilot training. The percentage of graduates sent to UPT, which averaged between 48% and 59% between 1980 and 1992, dropped to 29% in 1993. See Chart 8-16 (Percent of Annual Air Force Academy Graduates are Pilots versus Percent of Total Air Force Annual New Pilot Accessions are Air Force Academy Graduates). As the number of UPT slots had been gradually decreasing, the percentage of Air Force Academy graduates filling those slots continued to climb, peaking at 55% in 1995. However, from 1996 onwards, the Air Force limited Academy graduates to 50% or less of the UPT slots. Although the Academy allowed cadets to resign without commitments upon learning that they would no longer be guaranteed pilot training slots, relatively few cadets resigned. This makes the Academy classes of 1993 through 1996 an anomaly worthy of further study since so few graduates became pilots. In addition, the Academy relaxed its policy that at least 70% of each entering class had to meet pilot medical standards, which in turn meant an increase in entering cadet academic standards since pilot-qualified applicants previously had been given preference over non-pilot qualified applicants. In fact, by 1998 as the Air Force increased pilot training slots, there were complaints that the Academy had too few pilot-qualified cadets, meaning that ROTC and OTS graduates would potentially take more of the UPT slots. Nevertheless, the Academy still offered the best chance of obtaining a UPT slot. See Charts 8-17 (Percent per Commissioning Source Annually Become Pilots) and 8-18 (Distribution of Annual Air Force Total Pilot Accessions by Source of Commission by Percent). See Joe West, "Pilot training slots slashed for academy grads," Air Force Times 3 Aug 1992: 3; Genevieve Anton, "Cadets staying at academy despite cut in pilot slots," Air Force Times 14 Sep 1992: 24; and Genevieve Anton, "Who will Fly? The Air Force wants more pilots, but fewer new officers are qualified...or interested," Air Force Times, 24 Nov 1997: 12-13.

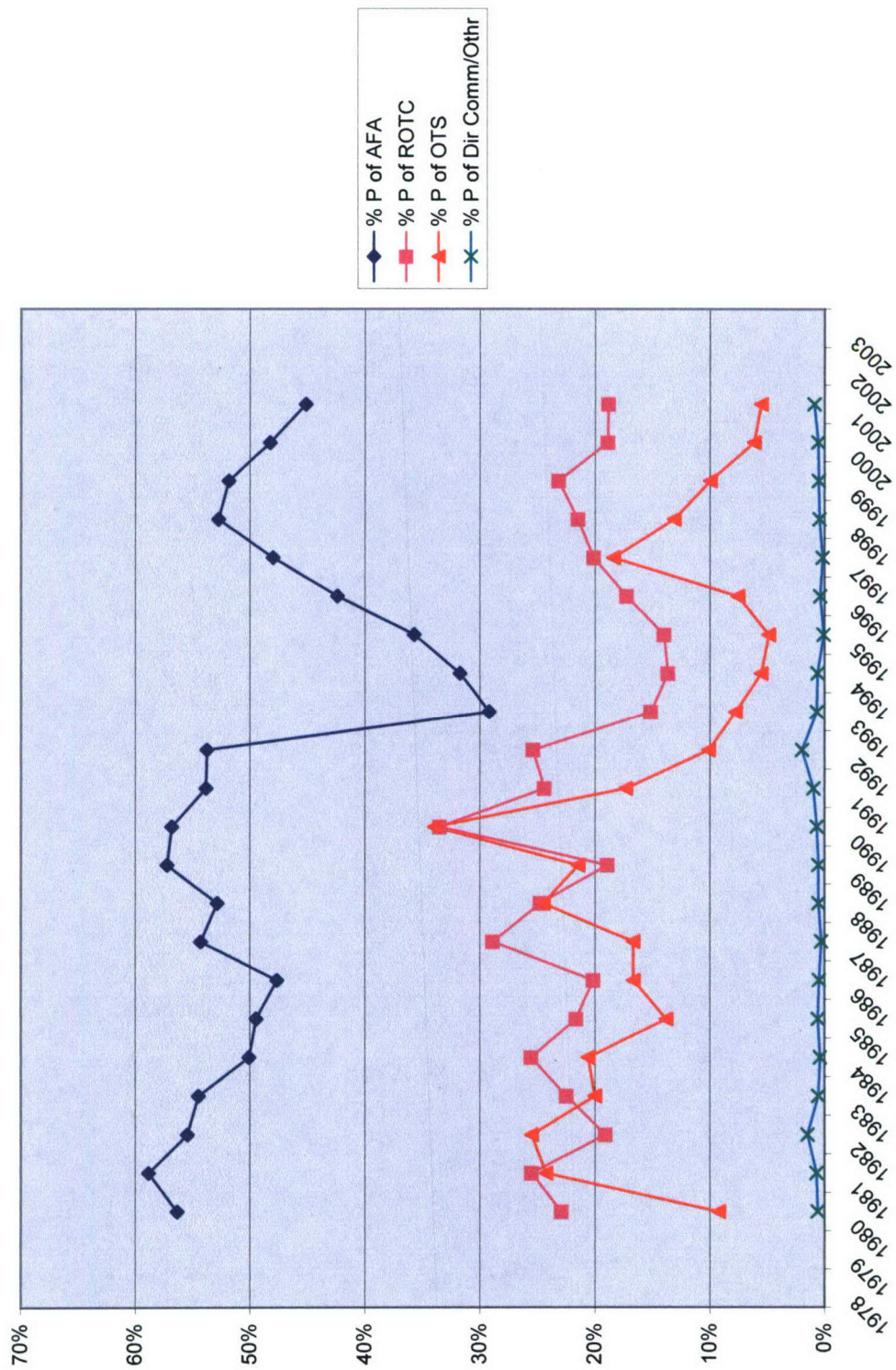
**Chart 8-16: Percent of Annual Air Force Academy Graduates are Pilots versus Percent of Total Air Force Annual New Pilot Accessions are Air Force Academy Graduates**



Source: Analysis and Reports Branch HQ Air Force Personnel Center (HQ AFPC/DPSAR)

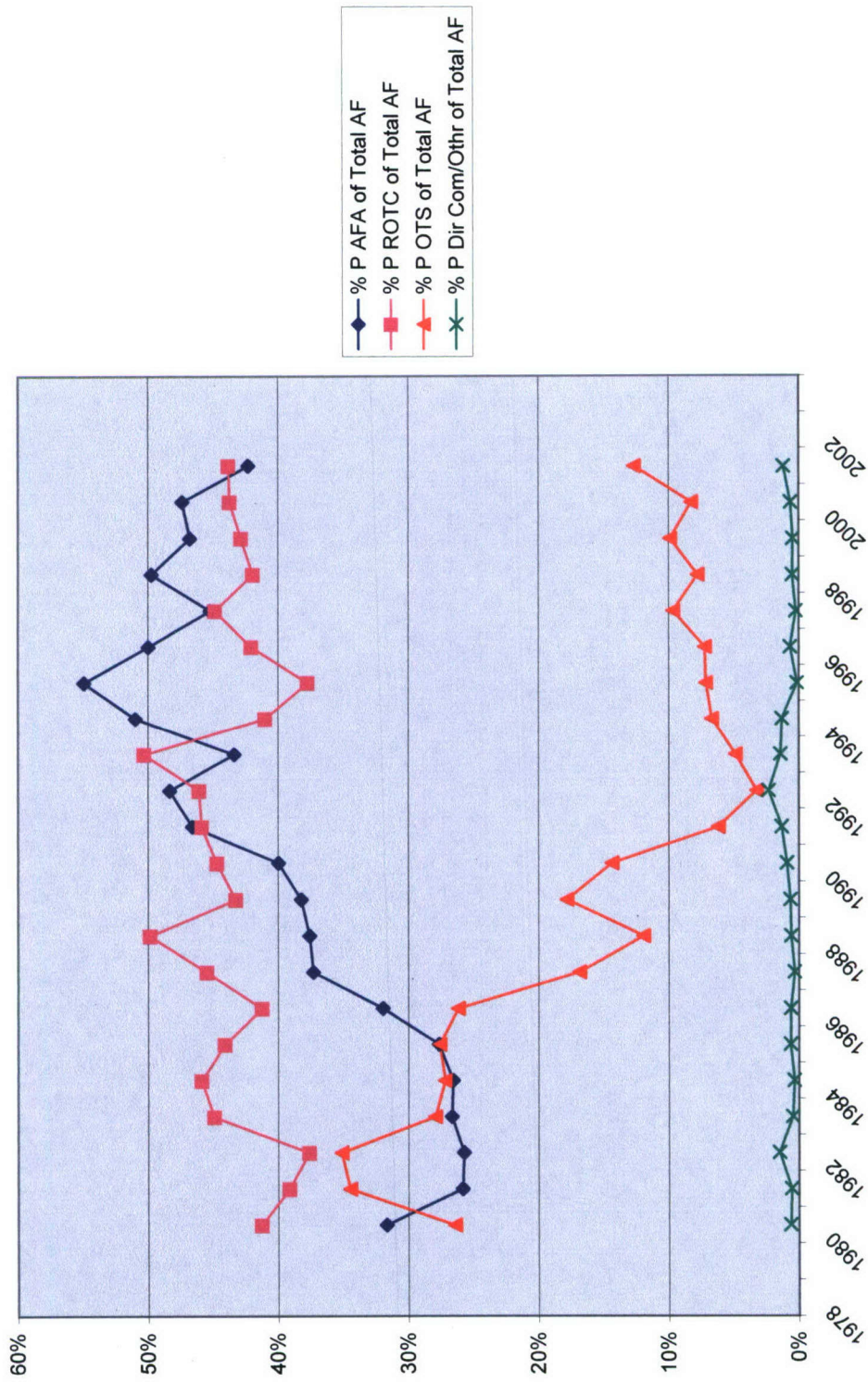


Chart 8-17: Percent per Commissioning Source Annually Become Pilots



Source: Analysis and Reports Branch HQ Air Force Personnel Center (HQ AFPC/DPSAR)

Chart 8-18: Distribution of Annual Air Force Total Pilot Accessions  
by Source of Commission by Percent



Source: Analysis and Reports Branch HQ Air Force Personnel Center (HQ AFPC/DPSAR)



the Air Force Academy provides a narrower and more pilot-focused view of the Air Force officer corps than AFROTC. Whereas West Point provided Air Corps and Air Force pilots with a broader basis and understanding of military operations and the officer corps and its traditions, the Air Force Academy is more the successor of the aviation cadet program where pilot's wings are the goal and the perceived key to everything else. Consequently, the decline in the importance of service academy graduation may be an indirect contribution to the rise in the importance of C4ISR in the Air Force officer corps.

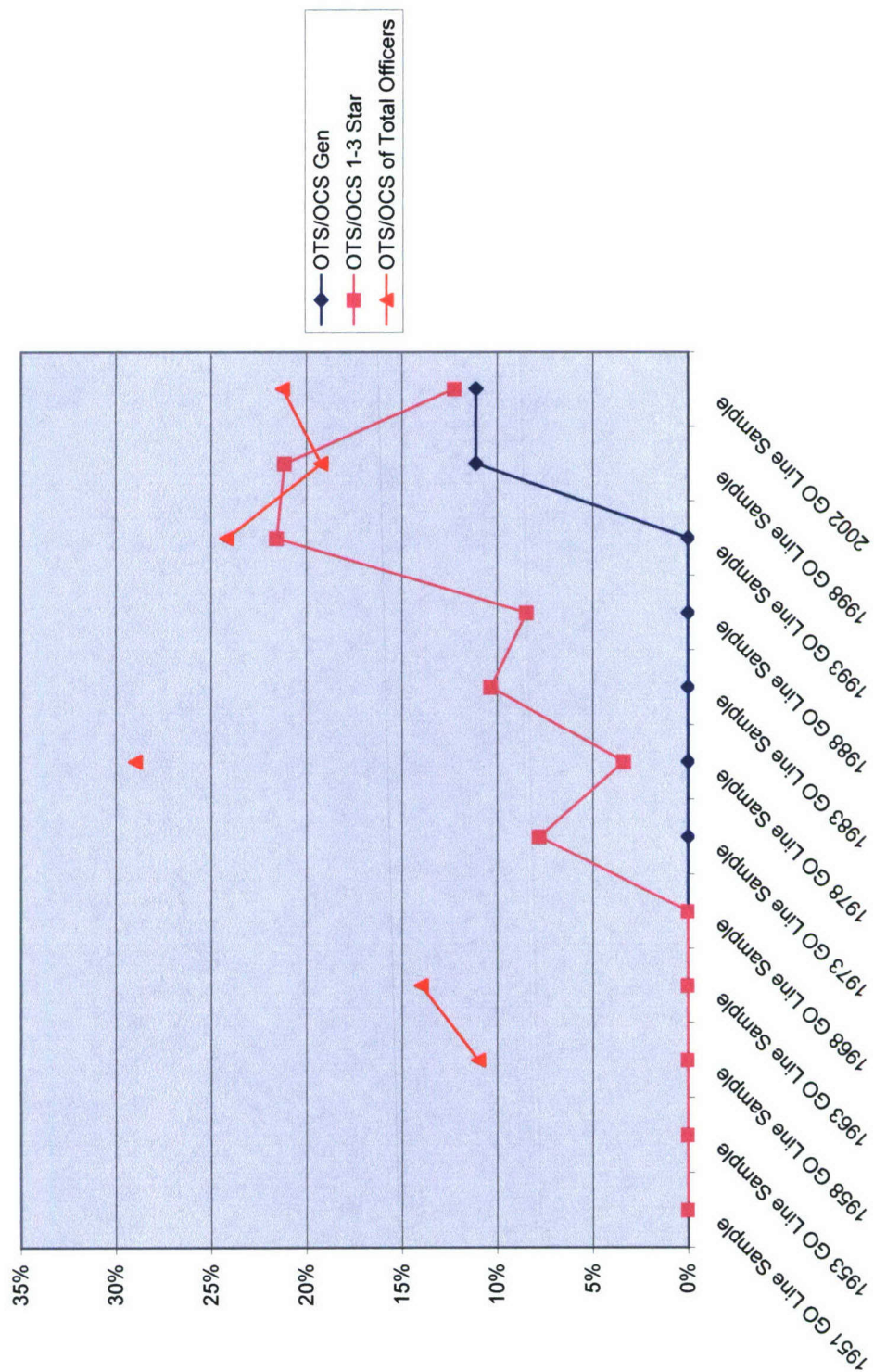
Air Force Officer Training School (OTS), and its predecessor, Officer Candidate School (OCS), have traditionally provided the most flexible method for accession into the officer corps. Since this officer training path occurs over the course of weeks, instead of the four years at the Academy or AFROTC, OTS/OCS can be quickly adapted to accommodate surges in officer accessions in times of conflict. In addition, prerequisites can also be quickly changed as a means to shape the quantity and quality of officer candidates admitted into the programs. If the Air Force officer corps needs more officers quickly, academic requirements, Air Force qualifications test scores, and medical requirements can be relaxed, and if the Air Force officer corps needs to limit accessions in order to meet mandated officer manning limits, OTS/OCS entrance requirements can be raised and accessions lowered or temporarily halted. OTS/OCS has also been the primary accession path for prior enlisted members to be incorporated into the officer corps. Finally, because of the short duration of OTS/OCS, its graduates

can be quickly shunted into any officer career fields experiencing acute shortages. Consequently, OTS/OCS graduates can serve in any career fields, including pilot and navigator. From this perspective, OTS/OCS is the closest modern form of accession into the Air Force officer corps to the aviation cadet program. However, the major difference is that OTS is designed to produce officers and not pilots.

The flexibility of the OTS/OCS program makes it the second largest accession source in the post aviation cadet Air Force officer corps. However, from a professional perspective, it is difficult to equate the short duration of its military indoctrination training to the multi-year AFROTC and four-year Academy military indoctrination experiences. Furthermore, many OTS/OCS graduates do not go to pilot training; so the argument cannot be made that flight training somehow provides the officers with all the officer training required as was the case with the aviation cadet program. In addition, officers with prior enlisted service can retire with less commissioned officer service than their officer-only contemporaries, so this segment of OTS/OCS graduates may be predisposed towards earlier retirements. Finally, since OTS effectively backstops and accesses officers with academic majors and specialized experiences that neither the Air Force Academy or AFROTC can provide, a segment of OTS/OCS graduates may appear to lean more towards being technical specialists than generic officers to the officer corps. As a result of these factors, OTS/OCS graduates have been historically under-represented in the general officer ranks. See Chart 8-19 (GO Samples: General versus 1-3 Star General Officers – Source Commission – OTS/OCS versus Percent



Chart 8-19: GO Samples: General versus 1-3 Star General Officers -- Source Commission --  
OTS/OCS versus Percent OTS/OCS of Total Officer Corps



OTS/OCS of Total Officer Corps). Although the OCS or OTS routes to an officer's commission have been available for the duration of the study, the first sample to report any OTS/OCS graduates in the 1-3 star general officers ranks did not occur until the 1973 sample, and the first 4-star general officer OTS/OCS graduate did not occur until the 1998 sample. The sharp decline in the percent of OTS/OCS graduates in the 1-3 star ranks in the 2002 sample is offset by a corresponding gain in the percentage of AFROTC graduates. Consequently, the story of officer accessions into the Air Force officer corps has changed dramatically over time. Initially, aviation cadet graduates provided the bulk of the manpower serving in the technical specialist role of pilot, with an extremely small percent of West Pointers with more knowledge, experience and training in military traditions, officership and warfare, filling key positions of responsibility and senior leadership. However, the preponderance of aviation cadet graduates in the officer corps led to their eventual domination of the senior most ranks and the inner leadership core of the Air Force officer corps long after the aviation cadet program was discontinued.

Ironically, the new champion of the heroic pilot warrior archetype became the Air Force Academy, which, freed of West Point's constraints to produce career officers for service in all Army branches, could shift from a broad warfare perspective to a very narrow, flying, and in particular, pilot-focused view of warfare and the officer corps. Since only pilots could command flying units and therefore rise to the senior ranks, it seemed only natural to stress the importance of piloting in Air Force officership,



establish quotas for pilot officer academic instructors and staff, make medical qualification for pilot training part of the admissions matrix, and include flight training in the curriculum.<sup>253</sup> However, Air Force Academy graduates were a minority of the annual officer accessions and even though most went to pilot training, they were also a minority there. Since the Air Force Academy curriculum, despite its emphasis on flying, does not appear to create better pilots than other commissioning sources, an emphasis on flying as the measure of the man and his leadership and decision-making ability meant that pilot officers from each commissioning source competed on a nearly level playing field. Consequently, AFROTC graduates in particular won promotions and senior positions roughly equivalent to their percentage of the composition of the officer corps as the number of aviation cadet graduates dwindled. This AFROTC graduate basis may be providing the broad and visionary perspective of warfare and the Air Force officer corps' expertise, jurisdictions and membership that one would have

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<sup>253</sup> The summer 2005 selection of Lieutenant General John Regni, the first non-pilot to be named Superintendent of the Air Force Academy (the senior, three-star general in charge of the Academy) exemplifies this point. The Association of Graduates, the alumni association, posted two announcements on staff changes in the same online article. The first welcomed Major General Irving Halter, "who has assumed the Academy's new vice superintendent position." "General Halter is a command fighter pilot.... He has served as an operational commander at the squadron, group and wing levels. And, he is a veteran of Operations Desert Storm, Provide Comfort and Enduring Freedom. In this new role, General Halter will provide continuity of leadership both as the Academy transitions to a new superintendent, and when the superintendent, as a university president equivalent, is involved in activities outside the Academy." Translation: Don't worry, we've created a new position so that a real fighter pilot will always be there both as a role model for cadets and to step in and take over if the other guy starts to do something wrong. The second paragraph congratulated Lieutenant General John Regni, who had been nominated to become the new superintendent. "His career has encompassed a wide range of personnel, training and command assignments, and he has served at base, numbered air force, major command, Air Staff and joint unified command levels." Translation: He's a non-rated guy. See Ted Legasey, "Online News: AOG Board Chair addresses the membership," *ZoomiEnews* 26 Sep 2005, Association of Graduates US Air Force Academy, 21 Jul 2006 <<http://www.usafa.org/zoomienews>>.

expected from the frequently longer and certainly deeper indoctrination of cadets provided by a service academy. Air Force Academy graduates as a group have not monopolized the senior leadership positions of the officer corps, and since an emphasis on C4ISR and its logical extensions is not completely compatible with a pilot-based concept of warfare, it is not clear that C4ISR would have become as important if the officer corps had been dominated by Air Force Academy graduates.

#### How Many Pilot Officers Does the Air Force Officer Corps Need?

It is clear that the officer corps' changing mixture of officer commissioning sources has had long term and dramatic effects on the evolution of the officer corps. The Aviation Cadet Program and the Air Force Academy both appear to be geared towards producing pilots first and foremost. This leads to another seemingly elementary question of how many pilot officers the Air Force officer corps actually needs. The answer to this question potentially lies in a variety of areas. The ratio of pilots to aircraft would seem to be a good place to start. Flight pay and bonuses is another area that touches on this issue. However, the biggest factor that obscures the answer to this question is the officer corps' apparent tradition of carrying an active-duty pilot reserve cloaked in non-pilot billets.

From roughly 1920 to 1940, the Air Force's predecessors were able to successfully hold the line that over 90% of the Air Service/Corps officers should be pilots. Of course, the World War II buildup and the Air Force's independence rendered the 90% line meaningless, at least outside the general officer ranks. In fact, the data



shows a relatively flat curve showing the decline in the percentage of Air Force officers who are pilots on flying status from FY1948 through FY2003. Consequently, a natural question is exactly how many pilots does the Air Force officer corps need? The percentage slices of the officer corps indicate the relative weighting of pilots within the officer corps, but they do not answer the question as to the officer corps actual needs. One might think that actual pilot needs appear in some sort of natural correlation between pilots and aircraft. Chart 8-20 (Comparison of Total Pilots on Flying Status to Total Active Air Force Aircraft) shows the relationship between the Air Force's total active aircraft inventory and the number of Air Force pilots at the end of each fiscal year. There appears to be a rough correlation between the curves, i.e., both curves generally climb and then descend. Chart 8-21 (Ratios: Pilots and Navs on Flying Status per Active Aircraft Inventory) shows the ratio obtained by dividing the total pilots on flying status by the active aircraft inventory per year, as well as the same ratio for the number of navigators on flying status and the active aircraft inventory. The pilot curve captures the independent Air Force's initial buildup of the ratio as first pilots increased in FY1949, and then excess aircraft began to be moved out of the inventory in FY1950. Then came the Korean War, which necessitated a recall to active duty of pilots and an increase in pilot training that initially outpaced aircraft production. This resulted in the ratio peaking in FY1951 at 3.4 pilots per aircraft, followed by a decline through FY1956 at 2.4 pilots per aircraft. Both pilots and aircraft continued, however, to increase in numbers through the Korean War and into the Cold War, with aircraft

Chart 8-20: Comparison of Total Pilots on Flying Status to Active Aircraft

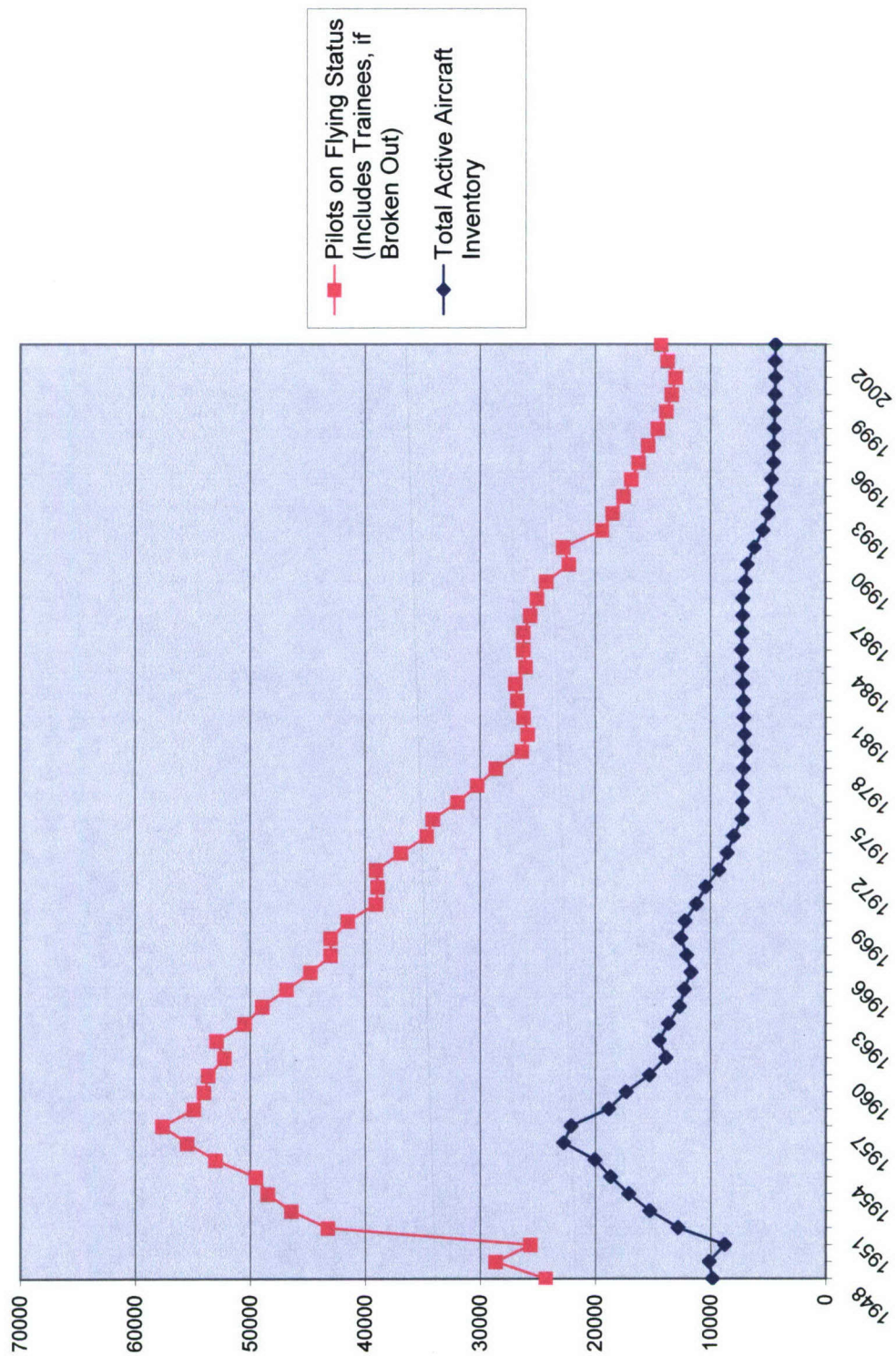
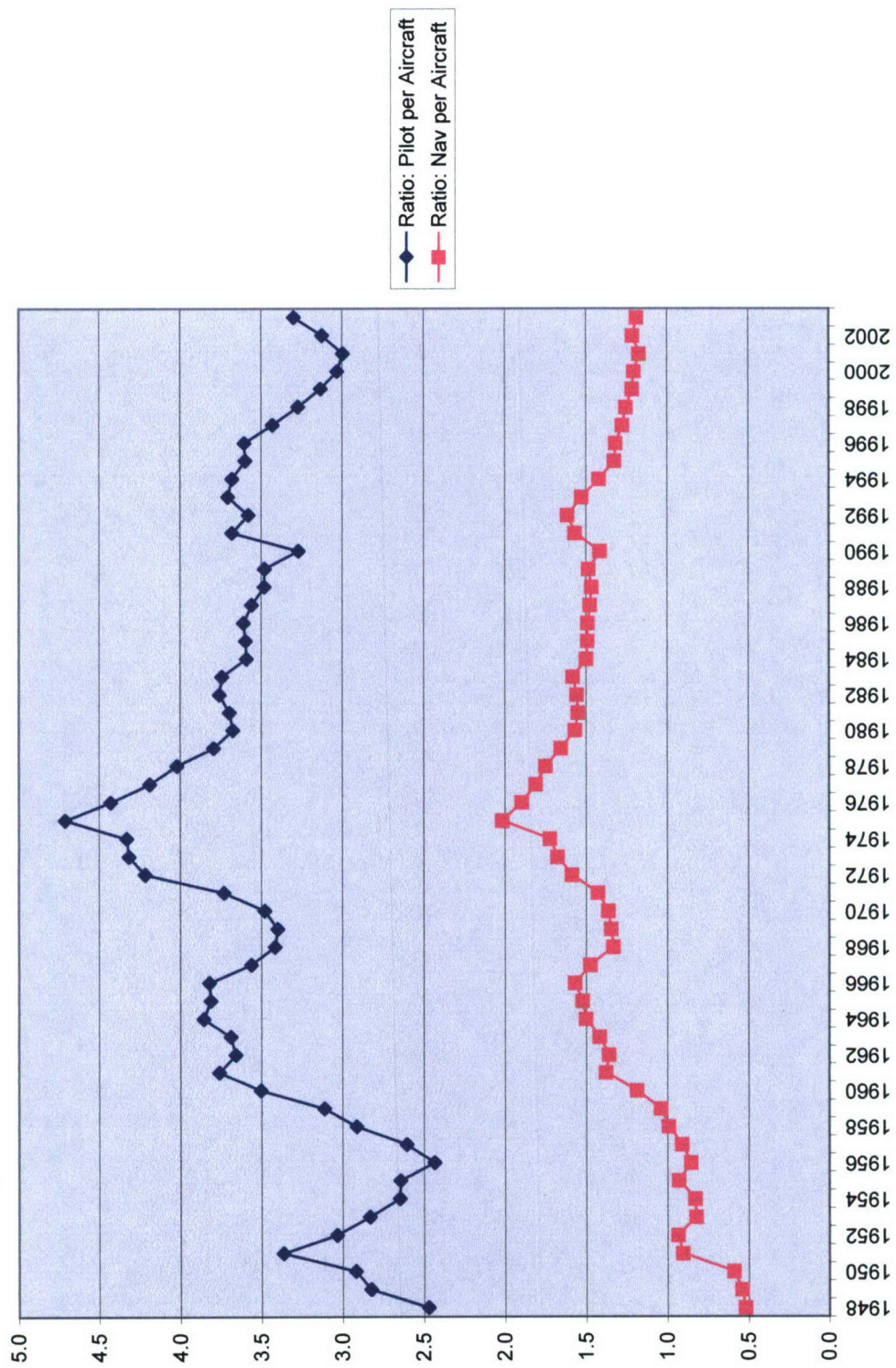




Chart 8-21: Ratios: Pilots and Navs on Flying Status per Active Aircraft Inventory



peaking in FY1956 and the number of pilots peaking in FY1957. After that, although both pilot and aircraft numbers were in decline, the number of aircraft decreased faster than the number of pilots, resulting in an increasing ratio of pilots to aircraft from FY1956 through FY1961. The ratio hovered around 3.8 pilots per aircraft through FY1966 then dropped through the hardest years of the Vietnam War as the number of pilots declined faster than the number of aircraft. By FY1970 the ratio was again in the upswing, peaking in FY1975 at 4.7 pilots per aircraft as the Air Force dumped aircraft faster than pilots in the post-Vietnam drawdown. The ratio dropped until FY1980 where it leveled out at roughly 3.5-3.7 through FY1995, except for a blip in FY1990 as pilots began to leave faster in the post Cold War world until Desert Storm. Overall this period reflected both the Carter/Reagan “buildup” which had the effect of leveling both the number of pilots and number of aircraft through the end of the Cold War, and the initial post Cold War drawdown in which aircraft and pilots were cut in the same orders of magnitude. From FY1996 to FY2000 the number of pilots decreased faster than the number of aircraft, resulting in the ratio decreasing down to 3.0. The ratio remained constant in FY2001, but began a new increase in FY2002 as the War on Terrorism began. The Air Force quickly issued a stop-loss order preventing rated and other officers from leaving the Air Force.<sup>254</sup> The total Air Force aircraft curve remained flat from the mid-1990s onward.

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<sup>254</sup> Presumably, many officers would have stayed in without a stop-loss order out of a sense of duty or patriotism, and perhaps because 9-11’s negative impact on air travel and airline hiring.



One could argue that there is obviously a correlation between the number of pilots and the number of aircraft, and that ratio lies somewhere between 2.4 and 4.7. Split the difference and call it 3.5 with a 1.0 margin of error. The 3.5 ratio of pilots to aircraft may indeed be a golden ratio of sorts, but the margin of error between FY1948 and FY1980 has dramatic ramifications. For example, in FY1956, when the pilot to aircraft ratio was 2.4, the Air Force had roughly 22,800 aircraft, and in FY1975 when the ratio was 4.7, the Air Force had roughly 7,200 aircraft. If the number of aircraft is held constant, then in FY1956 the Air Force officer corps needed an additional 22,800 pilots to bring the ratio up to 3.5. In FY1975 the Air Force officer corps would have had to fire 7,200 pilots, if it kept the number of aircraft constant but wanted to get back down to the 3.5 ratio of pilots per aircraft. And in FY2003, the Air Force officer corps was short by 800 some pilots if it kept the number of aircraft constant but wanted to achieve the 3.5 pilot to aircraft ratio. In terms of percentages of the pilots on flying status, the shortages or overages equate to 41% of the total pilots on flying status in FY1956, 21% in FY1975, and 6% in FY2003. Of course, the Air Force can and does also adjust the number of aircraft at the same time it is adjusting the number of pilots in the officer corps. In fact, if the 3.5 ratio is the golden ratio, then the Air Force officer corps of the '80s, '90s and '00s seems to be closer to the mark than ever in its history.

On the other hand, looking for a golden ratio might be misleading. The Air Force officer corps would certainly not be willing to let itself be caught short by approximately 41% of its pilot needs, but Congress and the American public would not

want to needlessly pay flight pay and bonuses to a third or fourth of the total pilots. One might also argue that the Air Force's history is marked by a series of anomalies, and has never reached anything near steady-state operations. That is, the pre-Korean War buildup, the Korean War, the 1950s Cold War, Vietnam, the Vietnam drawdown, the post-Cold War interlude in the 1990s and the post 9-11 world were all anomalies. The tendency of the curve to center around 3.5 is misleading and world events forced it to be wherever it was at any given time. This line of reasoning, however, discounts the perpetual negotiations between society and the profession manifested in Congress' role in the Air Force's budget as well as the Air Force officer corps' personnel policies and membership decisions controlling the amount of pilots in the profession.

There may not be an easy, yet specific ratio between the number of pilots on flying status and the active aircraft inventory, but the curve's centering around 3.5 is remarkable given the many changes the Air Force has undergone. For example, the decline of the bomber force and the rise of fighters also would appear to translate to a reduction in pilots per aircraft since bombers typically require two pilots, but fighters typically require only one. In addition, in the mid-1970s the Air Force changed flight pay systems partly to shed itself of the need to maintain a fleet of simple aircraft for pilots to be able to fly routinely in order to qualify for flight pay. Consequently, the 3.5 pilots per aircraft ratio might simply reflect a number that the Air Force officer corps is comfortable with. In fact, the ratio may be skewed because it simply takes how many pilots the Air Force happened to have on flying status and compares it to aircraft



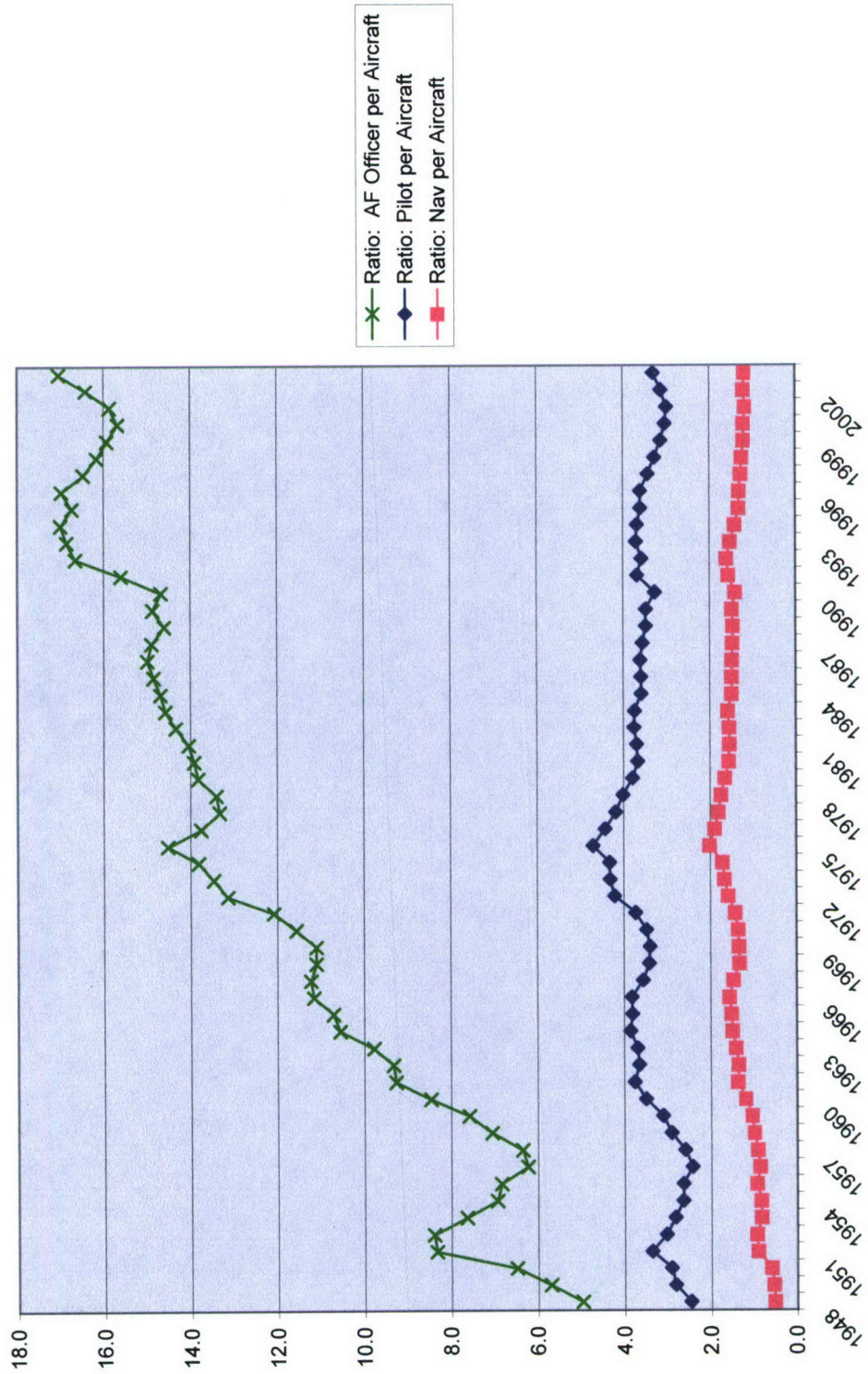
numbers. If the Air Force officer corps at one time thought of itself as a flying club, in which pilots wings were a prerequisite to membership, but actual flight currency in front-line combat aircraft was not a requirement for continued membership, the 3.5 ratio may be inflated. If the officer corps successfully padded its pilot requirements over time, then the 3.5 ratio merely captures a historic approximation of how many pilots per aircraft the Air Force maintained—not what it actually needed.

Furthermore, the Air Force officer corps may not be able, or willing, to define the true minimum required ratio of pilots per aircraft. The ratio would change with every new aircraft added to the inventory, each subtraction from the inventory, and any changes to doctrine, and perhaps even tactics. The Air Force might not be able to maintain such a fluctuating target, and it would be difficult to explain all the changes to Congress and the public. It also might not be prudent to publicly inform the world about all changes in doctrine and tactics. Consequently, the 3.5 ratio, may work as a rule-of-thumb, quick appraisal of where the Air Force stands with respect to the metric of pilots and aircraft.<sup>255</sup> However, as the ratios of pilots and navigators per aircraft have remained in fairly narrow bands, the ratio of total Air Force officers per aircraft has tripled, going from approximately 5:1 in 1948 to roughly 17:1 in FY2003. See Chart 8-

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<sup>255</sup> It is also possible to look at aircrews to aircraft as well as combat aircrews to combat aircraft ratios. The USAF Statistical Digest reporting for FY1950-FY1980 indicates a relatively firm 1.5:1 ratio of combat-ready aircrews to combat-ready aircraft. However, to be useful, one must be able to differentiate the number of combat-ready aircraft by type since some are crewed by multiple pilots. Furthermore, this method would provide the number of combat-ready pilots, but not how many pilots are required to field that number of combat-ready pilots. Those ratios are much more erratic in the data. Nevertheless, this still shows that there is a correlation between the number of pilots needed and aircraft.

Chart 8-22: Ratios: All Officers, Pilots on Flying Status, and Navs on Flying Status per Active Aircraft Inventory





22 (Ratios: All Officers, Pilots on Flying Status, and Navs on Flying Status per Active Aircraft Inventory). This indicates the general officer corps' shift in focus away from an airplane-centric view of the world since technology has led to a downsizing of direct aircraft support functions like maintenance.

Although the ratio of 3.5:1 pilots on flying status to the active aircraft inventory appears to be a good rule of thumb, the Air Force officer corps does not rely on the ratio to justify the number of pilots it needs. The officer corps has a built-in bias for having too many rather than too few pilots, primarily because it takes time to create a new pilot. In the jet age, undergraduate pilot training takes approximately a year, which is followed by several months of further training before a pilot is qualified in a front-line aircraft. Consequently, the system has been designed to make it easy to keep pilots in the officer corps. First there is a longer service commitment for graduates of flying training than for officers simply commissioned or sent to technical training. Second, flight pay and bonuses provide economic incentives for remaining on active duty and in flying status. During wartime, stop-loss orders can keep pilots in. However, there is no personnel process in place to quickly dump pilots. In fact, the regular versus reserve system that favored pilots for most of its history meant that Reductions in Force (RIFs) would disproportionately eliminate non-pilot officers.<sup>256</sup> RIFs protected officers with

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<sup>256</sup> For example, in the post-Vietnam drawdown, the Air Force held a RIF board in November 1974 that reviewed 20,295 reserve officers and selected 1133 for involuntary separation. Of those officers, 32 were non-line, 337 (31% of line officers separated) were pilots, 53 (5% of line officers separated) were navigators, and 711 (65% of line officers separated) were non-rated line officers. In FY1975 pilots made

regular commissions and dumped officers with reserve commissions. Consequently, the natural tendency to err on the safe side and overestimate pilot needs was magnified by the regular and promotion systems that benefited pilots over non-pilots. Consequently, the two big waves of former aviation cadets, regular boards and promotion boards, and successive draw-downs resulted in the active Air Force officer corps' creation of a built-in pilot reserve buffer.

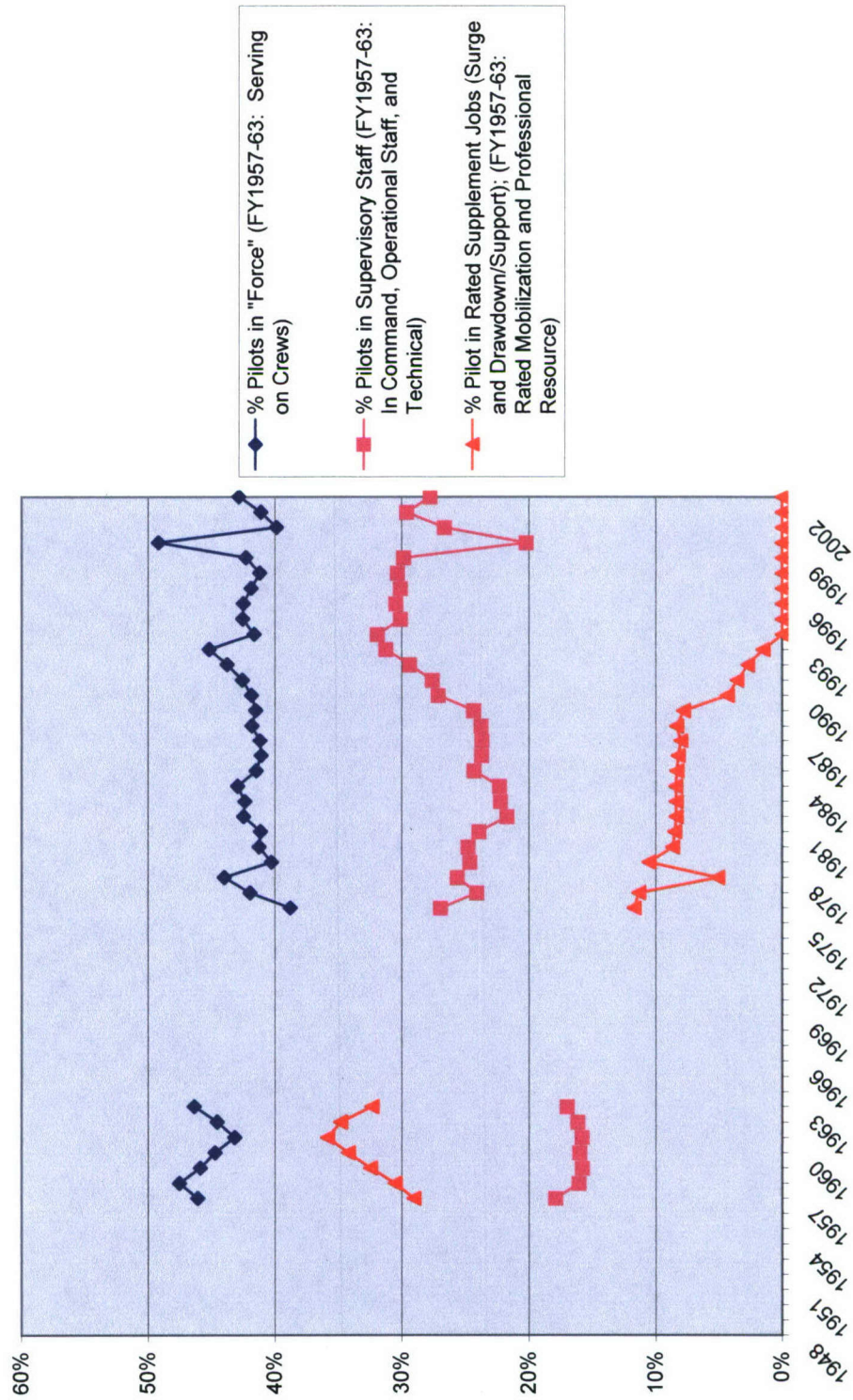
However, as the World War II wave of pilots aged, this reserve buffer took on more the appearance of a welfare system. Chart 8-23 (Comparison Percentage of Pilots Serving in Various Categories (FY57-63 Excludes GO) (FY1976-2003 Excludes GO, Colonel and UPT Students)) indicates that the Air Force has historically maintained roughly 40%-50% of its pilots on flying status out on the flight line, i.e., serving in flying units at wing level and below. From FY1957-FY1963, about one third of the pilots on flying status were classified as "Rated Mobilization and Professional Resource." These pilots were scattered around in all sorts of staffs and jobs that were not directly connected to flying. However, they still flew whatever aircraft were available at their particular base to qualify for flight pay and to ostensibly keep up their flying skills. If a major war were to break out, these pilots would be pulled out of their desk jobs and quickly brought up to speed in combat aircraft or at least in some sort of useful cargo or trainer aircraft in order to free full-time flying pilots to switch to combat

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up 37% of the total line officers, and non-rated officers made up 47% of the total line officers. See "Analysis of RIF Board Results," Air Force Times 12 March 1975: 14.



**Chart 8-23: Comparison Percentage of Pilots Serving in Various Categories  
(FY57-63 Excludes General Officers (GO))  
(FY1976-FY2003 Excludes GO, Colonel and UPT Students)**



aircraft. However, as a pilot's front-line aircraft flying experience became more distant, this proposition became more questionable. As the Air Force quickly progressed through fighters in particular, but also other aircraft types in the 1950s, World War II and even Korean War vintage aircraft were first moth-balled, then declared totally obsolete. A bench of pilots who had never flown the current generation of front-line aircraft was considerably less an asset than a group of pilots who would be stepping back into aircraft that they had flown within the last three years.

Congress was sensitive to the issues of paying flight pay to pilots who did not need to be flying as well as paying flight pay to pilots who were no longer flying. Congress applied general pressure on the Air Force to minimize this cost and also at times set limits on the numbers of fliers that could receive flight pay. Although flight pay was initially tied to the flier's base pay and ratings, it was separated into an independent pay scale in 1949. Until 1974, flight pay was based on the requirement that fliers fly a minimum of four hours a month to qualify for the proficiency pay, but over time, there were minor modifications concerning a flier's ability to carry hours forwards or backwards to cover several months of non-flying.<sup>257</sup> The Air Force and its

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<sup>257</sup> "All About Money-IV: Hazardous Duty Pay Goes to 100,000-Plus," *Air Force Times* 28 Sep 1966: 13. The pay itself, whether loosely labeled flight pay, proficiency pay, or incentive pay was paid before FY1974 on the basis of whether the flier logged the requisite four hours a month. Congress changed the flight pay system in 1974 and gave the services through May 1977 to transition to the new system. After FY1977, the pay is based on the officer maintaining flying status (which means primarily medically qualified to fly and no disciplinary problems—not actually flying) and meeting the flying time gates. In neither case did/does flight pay equate to being qualified (e.g., as a copilot) or current (e.g., so many night hours or landings within the last six-month window. Although navigators needed a navigator station on the aircraft to count the time, students and fliers that were not "current" still could count flying time under an instructor or first pilot's supervision towards flight pay.



predecessors has always used some sort of flying board to review the records of pilots and navigators on flying status to determine when or if a flier should be taken off flying status, effectively ending their flight pay. After the Korean War, the Air Force began running central flight status selection boards on a broad scale to limit the number of fliers drawing flight pay.<sup>258</sup> Although some fliers were grounded due to medical or other reasons, most rated officers grounded by the boards had spent larger amounts of their careers in non-flying jobs in comparison to those kept on flying status.

Consequently, they were the easiest to sacrifice. These grounded fliers were kept in the Air Force officer corps, serving in non-flying positions. They effectively formed the deepest of deep reserves for potential wartime pilots and navigators. The annual USAF Statistical Digests tracked these officers as pilots not on flying status through FY1966.

The flight status boards also determined whether those fliers kept on flight status would be placed in *excused* status or kept in active flying. Congress began authorizing the *excused* status in 1960 as part of the annual appropriations bill as an attempt to trim some of the costs of proficiency flying.<sup>259</sup> *Excused* fliers were still paid flight pay, but excused from flying requirements. Consequently, by reducing the number of fliers flying just to get their four hours a month, the Air Force could eliminate some of the aircraft and maintenance personnel stationed at bases solely to support proficiency flying. Excused fliers were generally older, with 15 or more years of service, although

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<sup>258</sup> Bruce Callander, "'Excused' Fliers Pass Screening," Air Force Times 11 Nov 1970: 8.

<sup>259</sup> Bruce Callander, "Flight Board will Weigh 5000 Rated," Air Force Times 13 May 1970: 8.

the loosely constructed decision points varied over time. Typically they had spent more time flying and had higher ratings than those fliers selected for grounding.

Consequently, they were rewarded. Excused fliers were theoretically maintained on flying status because they might be used again as active fliers. This did happen during the Vietnam War, but as a general rule, excused status was granted automatically and maintained through retirement.

Fliers maintained on active flying status could be front-line, full-time fliers or fliers logging their four proficiency hours a month while serving in positions similar to their grounded and excused brethren. During the Vietnam War, many officers in the four-hour-a-month-club were sent by the boards back to full-time flying positions. As the number of pilots in the Air Force continued to decline, it became more difficult for an officer to maintain flying status and totally avoid full-time cockpit duty after just one or two flying tours, although this had been common before the Vietnam War. For example, in the earlier years, under the four-hours-per-month system, the Air Force could take an aviation cadet, service academy graduate or other new 2<sup>nd</sup> lieutenant with experience or a degree in weather or communications, and send him to pilot training. After graduation, he could spend most of his career forecasting weather or working in communications, but still fly for flight pay and earn his senior and command ratings. This officer could be periodically popped into pilot billets, but his career emphasis would be forecasting or electronics. However, as a pilot, he would be eligible for command over weather aircraft squadrons, or the Air Force Communications Service.



The same thing could be done with an existing officer, and in the case of an aviation cadet, after he completed flight training, the Air Force could send him to get a degree in weather or electronics, and he could be used the same way.

In some years, the categorization of fliers was a fairly automatic process, but in others records underwent more scrutiny, depending on perceived Air Force needs and Congressional limits or pressure. The Air Force viewed the central flying status selection board as critical “in shielding the Air Force from potential legislation which would threaten the welfare of the rated inventory.”<sup>260</sup> *Welfare* was the proper word choice. The Air Force officer corps was caught between what it perceived to be required, but conflicting responsibilities. On the one hand, the officer corps had to demonstrate to Congress that it was indeed judiciously using the excusal authority. The officer corps was not to pad its requirements and have Congress to continue to pay flight pay to officers who would most likely never fly again in front-line aircraft. On the other hand, the officer corps felt a need to convince young flying officers that the benefit would be there for them later, too. If they flew enough and earned their senior pilot or navigator rating at seven years and their command pilot or master navigator rating at 15 years, then they could be finished with flying at 15, but still garner flight pay until retiring.<sup>261</sup>

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<sup>260</sup> Callander, “Flight Board will Weigh 5000 Rated,” 8.

<sup>261</sup> Callander, “Flight Board will Weigh 5000 Rated,” 8.

The Air Force Times reported in May 1966: “Without this incentive, AF said, it could not hold able young men. They would not be interested if they saw the flight money ending when they left the cockpit and moved into more responsible command, staff, and technical jobs.”<sup>262</sup> The assumption that rated officers, i.e., primarily pilots, would be moving into *responsible* command, staff and *technical* jobs is telling, as is the apparent refusal to consider non-rated officers seriously for them. It was somewhat perplexing that large numbers of officers who joined the Air Force simply for the joy of flying later wanted to be paid handsomely not to fly anymore. However, part of the answer lay in the fact that pilots could easily transfer their flying skill to other organizations, e.g., civilian airlines. It was a matter of which prism an officer used to define his profession and its expertise—flying or war. The Air Force Times reported on a 1967 Air Staff study on officer retention:

Young pilots are concerned about the return to the cockpit of many older pilots from R&D and other technical areas. The report says it appears that if a young officer sees nothing but cockpit duty ahead, he might just as well fly for the airlines “where the dissatisfiers (sic) are well controlled and his job is flying, *per se*, and not performing alert-duty.”<sup>263</sup>

Consequently, the Air Force officer corps’ understanding of flight pay evolved over time from that of extra compensation for extremely dangerous work to that of a financial incentive to lure the best officer candidates into Air Force flying and then to keep them in the Air Force officer corps to ensure a pool of pilots for wartime

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<sup>262</sup> “Hubbell Group To Look Hard At Flight Pay,” Air Force Times 11 May 1966: 1.

<sup>263</sup> Ed Gates, “Officers Exits Probed,” Air Force Times 10 May 1967: 10.



mobilization as well as a pool for senior leader selection. As the 1966 Air Force Times article paraphrased the evolution:

Air Force's own view of flight pay has changed in recent years. It once stressed the dangers of flying and the fact that flying was AF's sole reason for being. As technology increased and ballistic missiles came in, a flight rating looked less like the sure ticket to the top in the Air Force. AF decided that remaining in a cockpit job could even become a penalty to career progression. Officials began to describe flight pay as an "incentive" to follow a rated career which might become an increasingly narrow one.<sup>264</sup>

The issue described here is less one of definitions for flight pay as much as it concerns the officer corps' realization that its expertise and jurisdiction was no longer only about flying. Furthermore, flight pay for excused fliers formed an integral part of the system limiting the progression of non-rated officers. The Air Force could not over-man line flying units since Congress controlled the manning, aircraft and flying hours. So the surplus pilots, often in field grade ranks were moved into non-rated jobs. Consequently, non-pilots could not only not command flying units, they could also not fill many of the top non-rated billets because they were being filled by fliers, often on excused status. Furthermore, rated officers were not just necessarily doing this out of interest or expertise in the non-rated positions. Instead rated officers were doing this because the

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<sup>264</sup> "Hubbell Group To Look Hard At Flight Pay," 1. In addition, rated officers dropped from 50% to 48% of the total Air Force officer corps from the end of FY1965 to the end of FY1966. At the end of FY1966, pilots made up only 34% of the total Air Force officer corps. The general officer ranks were 85% pilots on flying status at the end of FY1966. A year later, the Air Force Times, citing Air Force Headquarters officials, was even more vocal about the pilots taking back control of the Air Force. "After nearly a year of whittling away at the rated force and preparing for the predominance of the missile, AF has done almost (sic) a 180 degree turn. For the foreseeable future, it again sees itself as a 'pilot's air force.' Aeronautical ratings which have been losing career value in recent years now promise to be worth more in the assignment and promotion market, Hq USAF officials said here last week." See "AF Restores 'Pilot' Image," Air Force Times 24 May 1967: 4.

prevailing opinion was that rated officers, and pilots in particular, should have these jobs. Pilots should have these jobs because pilots needed to broaden their experience base in order to prepare for command at higher levels over both flying and non-flying units, and because important jobs should be in the safe hands of pilots. Finally, if the prestige and promotions were not sufficient draws, rated officers were receiving incentive pay to stay in the Air Force and fill these command, staff, and technical positions that obviously did not require flying currency, that non-rated officers might be more qualified to perform, and that non-rated officers were willing to perform without extra pay.

Many field grade and higher fliers continued on excused status or in the four-flying-hours-a-month-for-flight-proficiency-pay status until the Air Force adopted the gated system for flight pay in the mid-1970s. In the gated system, however, tours involve either flying real front-line aircraft or completely non-flying. The in-between world in which a pilot could be a weather forecaster or communications officer, but still grab a few flying hours here and there on simple aircraft during the month is gone. Consequently, the gated system was consciously designed to provide a possibility for rated officers to move into non-rated officer fields for one or more tours. As legislated in 1974, the first gate requires a minimum of six years of flying duty, including initial flight training, by an officer's 12th year of aviation service in order to qualify for flight pay through the 18<sup>th</sup> year of service point. Aviation service typically begins with initial flight training. Nine years of flying duty by the 18<sup>th</sup> year of aviation service ensures



continuous flight pay through the 22<sup>nd</sup> year of service, and eleven years of flying duty by the 18<sup>th</sup> year of aviation service ensures flight pay through 25 years of service.<sup>265</sup> Stated in a slightly different way and assuming a front-loaded flying career, an officer with fewer than six years of flying duty still gets paid flight pay to the 12 year point, i.e., theoretically for six years or more of not flying. An officer with just over six years of flying duty gets paid flight pay to the 18 year point, i.e., theoretically for up to 12 years of not flying. An officer with just over nine years of flying duty gets flight pay to the 22<sup>nd</sup> year point, i.e., theoretically for up to 13 years of not flying. And an officer with 11 years of flying duty gets flight pay to the 25 year point, i.e., theoretically for up to 14 years of not flying.

The theoretical limits of paid non-flying years remain theoretical in most cases since the officer corps has not typically retained officers who purposely fail to meet their gates. In fact, the tendency has been to front-load the flying time for a variety of reasons. First of all, the officer corps wants flying squadron commanders, who are usually lieutenant colonels with roughly 15 to 20 years of service, selected from a pool in which all officers have met their gates and achieved senior and command pilot ratings on time because these are indications of high experience levels in flying operations. Both ratings require a mix of flying hours and years of aviation service.

Consequently, flying early and often ensures that an officer will not be caught short of

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<sup>265</sup> The flight pay scale is somewhat diamond-shaped. It starts out low, but increases quickly in the early years, maximizing pay in the middle years, then decreasing at the end, effectively eliminating the economic incentive for colonels and general officers. The officer also has to remain on flight status, which means primarily passing an annual flight physical when not actively flying.

flying hours when they become important. Second, the officer corps does not want to flood flying squadrons with field grade officers. It would potentially confuse the administrative structure of a squadron, where rank still plays a role, to have several officers wearing the same rank as the commander, but having no real authority, or possibly less authority than certain majors. It would also limit the promotion potential of the field grade officers serving in flying squadrons but not in positions of responsibility.<sup>266</sup> Finally, there is the simple issue of time. The traditional career path calls for an academic year at Command and Staff College upon promotion to major with a follow-on assignment to a staff job of some sort. This effectively cuts the seven years of potential non-flying time prior to meeting the third gate (eleven years flying years required by 18 years of aviation service) down to four years if the officer serves only a two-year staff tour. The Goldwater-Nichols legislation on joint officers forces officers to serve a joint tour to remain competitive for promotion to general officer, and therefore, indirectly to colonel. Consequently, if the officer does a second staff tour in order to have one tour for exposure on the Air Staff and one to meet the joint officer requirement, then the window is cut by another two to three years.<sup>267</sup> This leaves room

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<sup>266</sup> This has been a problem in AWACS (and JSTARS) squadrons for example, where the crew positions actually require field grade officers to head the mission crews since an AWACS could end up running an air defense sector or an entire operation if ground sites go down or lose communications links to the aircraft. However, promotion boards do not understand the large number of field grade officers who are not squadron commanders or operations officers, and are instead just line fliers presumably doing nothing more than captains, lieutenants and non-commissioned officers.

<sup>267</sup> The Goldwater-Nichols requirements push the services to maintain an average three-year joint tour length, which can then lead to non-rated officers serving longer joint tours to keep the average up as pilots are pulled out of the joint tours earlier.



for a one to two year tour in another specialty. Although an officer could trade staff jobs tours for more time in another specialty, this does not appear to be a frequent occurrence in company grade ranks. Consequently, it is not unusual for officers to gather eleven years of flying duty without much non-flying duty and spend many non-flying tours in the field grade and higher ranks.

The end effect is that the officer corps front-loads the flying, thereby keeping most lieutenants and captains in the cockpit. More non-rated officers, in communications for example, must be available to work the evermore complicated communications world since pilots would be unlikely to be able to squeak in more than one tour until they have met all their gates and ensured continuous flight pay through 25 years of aviation service.<sup>268</sup> At that point, the fliers typically are field grade officers, taking away staff opportunities for non-rated officers and not learning another aspect of the profession from the ground up.

In addition, when the law on the gated flight system was passed in 1974, the service obligation for flight training was five years, including the training. A flier would face the decision to stay in the Air Force or leave before having amassed enough flying duty to make the first gate and before he was in the highest category of flight pay.

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<sup>268</sup> Furthermore, an officer that cross-trains into pilot training after beginning in another career track cannot typically be used in a dual-track status, rotating between tours as a pilot and in his previous career field. Officers who switch to the pilot (or navigator or air battle manager) career field technically start their clock for their flying gates later and have the same amount of time to meet their gates for flight pay purposes. However, in order to remain competitive for field grade promotions and command opportunities, such an officer must make up the lost flying time. The newer pilots are expected to reasonably match their on-time peers in terms of flying hours, and job progression within a flying squadron. In effect, by starting later, they have less time.

The service obligations for flight training have increased, however, to the point that a flying officer now first faces the stay or leave decision after the officer has entered the maximum flight pay window and after the officer has easily met the six years of flying duty, is pretty close, if not on the nine years of flying duty mark, and can easily see the eleven years of flying duty point. Furthermore, at nine years of service, the promotion board for the rank of major lies in the not too distant future. Consequently, the combined effect of the 1974 law and the increased service obligations for flying training is that the Air Force is now offering significant economic incentives to a group of officers whose past was largely flying but whose future consists primarily of non-flying duties.<sup>269</sup> The gated flight pay system then begins to look very similar to the old excused status situation, except that in the gated system the flying requirements were clearly defined.

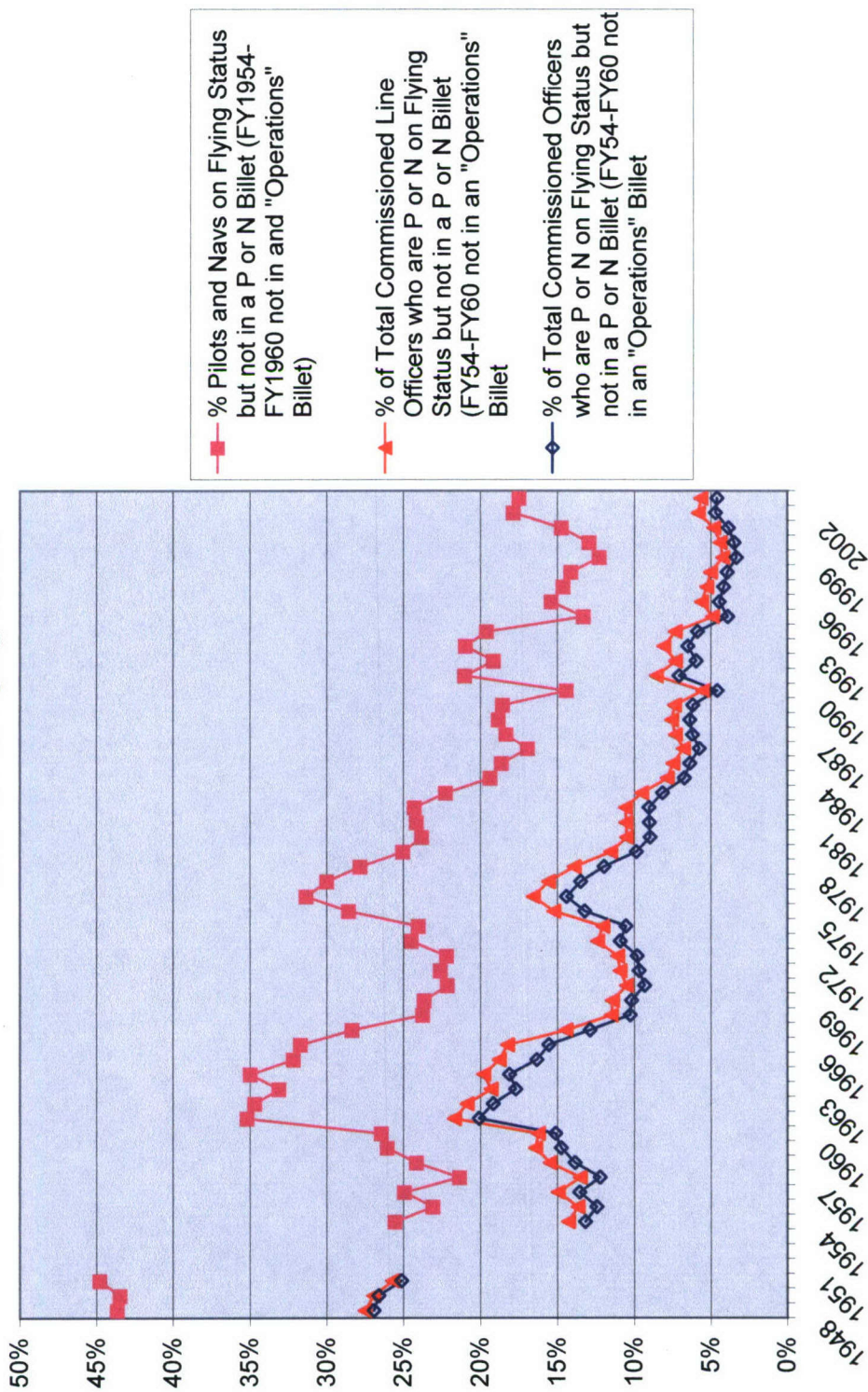
The effects of the flight pay economic incentive show up in several spikes in the percentages of rated officers serving in non-rated billets. See Chart 8-24 (Comparisons of Pilots and Navs on Flying Status Who Are Not in Pilot or Nav Billets, by Percent of Total Commissioned Officers and Total Pilot and Nav on Flying Status). The end of the World War II rated wave spiked the number of number of rated officers serving in non-rated billets in the early 1960s. The post-Vietnam drawdown, coupled with the Air Force's propensity to keep rated officers first, resulted in another spike of rated officers

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<sup>269</sup> Of course, the fliers must continue to serve and be promoted in order to reap the benefits of the gated flight pay system.



**Chart 8-24: Comparisons of Pilots and Navs on Flying Status Who Are Not in Pilot or Nav Billets, by Percent of Total Commissioned Officers and Total Pilot and Nav on Flying Status**



not serving in pilot or navigator billets in the mid 1970s. The post Cold War and Desert Storm drawdown created another such spike in the early 1990s. The graph also indicates another spike starting in FY1999 and extending through FY2003. The effect of each such spike was that rated officers took potentially promotable billets from non-rated officers. This concurrently allowed rated officers, primarily pilots, to broaden their portfolios and potentially increase their future promotion chances.

Non-rated officers did not have this possibility since the officer corps did not purposely seek a surplus of non-rated officers in any field. After all, a non-pilot officer could not command a flying unit legally until 1974, and after the law changed, Air Force policy has restricted command of flying units to rated officers. Consequently, a rated officer could move into a non-rated line field and stay, return, or move into another non-rated position, all at positions commensurate with the officer's rank. A rated officer, especially a pilot, was qualified for any position in the line. However, non-rated officers were limited to non-rated fields and could not move into rated fields unless they applied for pilot, navigator or air battle management training and essentially started their career over in the rated world.<sup>270</sup> The pilot, and now navigator and air battle manager retention bonuses on top of flight pay indirectly perpetuate these

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<sup>270</sup> It is possible for a non-rated officer to apply to periodic boards for selection to pilot, navigator or now ABM training. The officer must be qualified for flight training, which includes medical as well as age restrictions. The age/rank restrictions are partly in place because a flier's life begins with undergraduate pilot, navigator or ABM training. A captain navigator selected for UPT starts at the same place as a 2<sup>nd</sup> lieutenant fresh from the Academy and the navigator hours are largely meaningless in terms of progression through the pilot phases to, for example, copilot then pilot then instructor pilot. A rather limited number of officers are selected, with the total determined by Air Force needs and previously screened pilot candidates coming directly from the Academy, AFROTC and OTS.



conditions since officers eligible for bonuses also are the officers with enough flying time under their belts to be eligible for staff and other non-flying positions.<sup>271</sup>

However, the big difference between the composition of the Air Force officer corps in the 1960s, the mid-1970s and the late 1990s is that the total number of pilots and their relative percentage of the officer corps both declined. Equally important, the numbers and percentages of pilots serving in non-rated billets also declined. Chart 8-25 (Comparison Pilots and Navs on Flying Status vs. Pilots and Navs in Pilot/Nav Billets) shows the dramatic difference between the number of pilots and navigators that the Air Force maintained on flying status and the actual pilot and navigator billets available. The billets coded for pilots and navigators are theoretically the only jobs that require a pilot or navigator.<sup>272</sup> In FY1951 the Air Force officer corps had 13,800 more pilots and

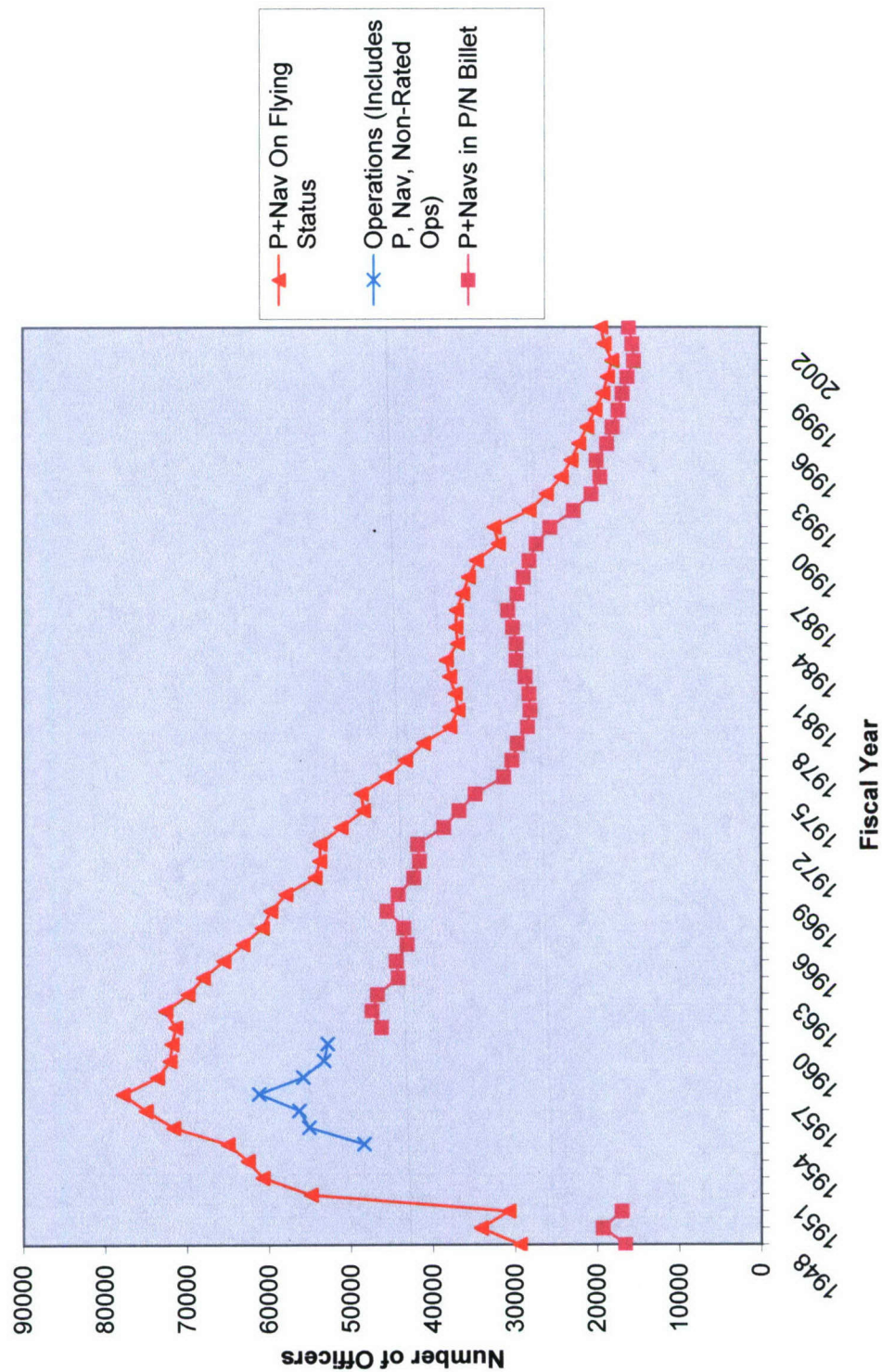
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<sup>271</sup> The bonuses are typically not offered until a flier nears his initial service obligation or is still in service past that point. The bonus programs are not one-time deals, but multiyear contracts, and pilots have frequently been able to move from one bonus plan to another as they gain seniority until they hit the 25 years of aviation service point. The bonuses amplify the effect of the longer initial service commitments. Fliers are offered large sums of money to stay in the Air Force but not necessarily to fly anymore. Paying pilot colonels \$25,000 annual bonuses on top of flight pay to stay in and then giving them promotable staff positions that do not require rated experience is frequently interpreted as evidence of a lingering high-level bias against non-rated officers. The Air Force has also at times threatened to ground pilots who did not take the bonuses, arguing that they were indicating an intention to resign as soon as possible and therefore, not worthy of further flying time.

Navigators and ABMs were offered retention bonuses for the first time in FY2003. At that time, navigators had to have at least a senior navigator rating, 15 years of aviation service and 18 years of service. ABMs had to be past their initial service obligation. Navigators and ABMs could sign up for a three year commitment and receive \$10,000 per year or for five years at \$15,000 per year. Pilots were offered \$15,000 and \$25,000. The Air Force was offering the bonuses to old navigators specifically so that they would stay and fill rated staff jobs so pilots, presumably on bonuses could return to fly. See Trowbridge, "New retention bonus brings navigators, ABMs out in Doves," 22.

<sup>272</sup> The USAF Statistical Digest's use of the *operations/combat* category between FY1954 and FY1960 clouds the issue somewhat since the category included non-rated operations-type officer billets that could have been filled by rated or non-rated officers; so I counted them all as rated billets, which downplays the numbers of rated officers serving in non-rated billets.

**Chart 8-25: Comparison Pilots and Navs On Flying Status vs. Pilots and Navs in Pilot/Nav Billets**





navigators on flying status than it had billets for. If pilots and navigators no longer on flying status are included, the number of pilots and navigators filling billets not requiring fliers jumped to 17,500. In FY1961 the overage of fliers on flying status was 25,132. In percentage terms, that equated to 35% of the pilots and navigators not serving in pilot and navigator billets, or 22% of the line officers. Over one-fifth of the Air Force line officers were pilots and navigators on flying status serving in billets that did not require a pilot or navigator. If pilots and navigators no longer on flying status are counted together with pilots and navigators on flying status in FY1961, then 33,600 pilots and navigators in either grounded, excused, or active flying status were filling billets that did not require pilots or navigators. That equated to 29%—almost one third of the line non-rated billets. FY1999 was by contrast the all-time low of 12% of the pilots and navigators on flying status not serving in pilot or navigator billets. These pilots and navigators comprised only 4% of the line officers. However, the percentages climbed again after FY1999. In FY2003, the difference between pilots and navigators on flying status and total pilot and navigator billets was 3,400, or 6% of the Air Force line officers. The Air Force officer corps does not seem inclined to bring these percentages lower; and the flight pay and bonus systems create a financial incentive aimed at retaining pilots long past their prime flying years. This in turn results in some number, perhaps 15% on average, of rated officers filling non-rated billets. This occurs more often than not in the field grade ranks. This provides the officer corps with a pool

of pilot colonels with sufficient non-rated experience to justify filling non-rated type general officer billets with pilots in over-proportional numbers.

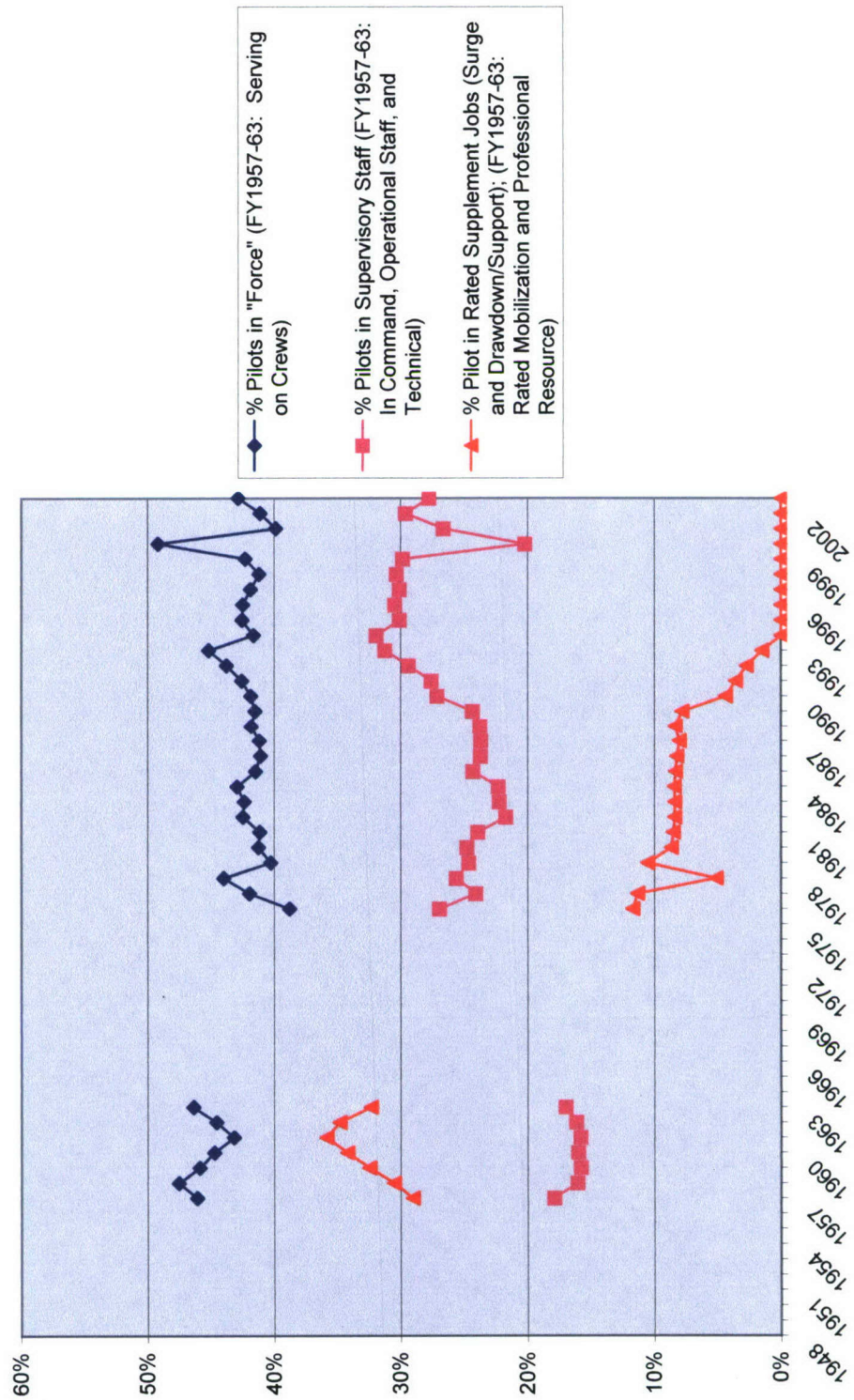
It is interesting to note that for FY2003 the Air Force reported that it was 430 pilots (3% of the pilot inventory) short of its requirement, but 550 navigators (13% of the navigator inventory) over. At the same time, its own data revealed that the officer corps had 3,400 more pilots and navigators on flying status (6% of the line officers) than pilot and navigator billets for them. Such discrepancies are partly explained by the Air Force's rather nebulous categorization of its requirements. For example, the Air Force days of excess rated officers appeared to conclude with the ending of the Rated Supplement job classification in FY1994. However, Chart 8-26 (Comparison Percentage of Pilots Serving in Various Categories (FY57-63 Excludes General Officers (GO)) (FY1976-FY2003 Excludes GO, Colonel and UPT Students)) and Chart 8-27 (Comparison Percentage of Navigators Serving in Various Categories (FY57-63 Excludes General Officers (GO)) (FY1976-FY2003 Excludes GO, Colonel and UNT Students)) indicate that the dramatic drop off in the percentages of both pilot and navigator rated supplements from FY1989 through FY1994 is offset in each case by an equal percentage increase in pilots and navigators in supervisory staff.<sup>273</sup> Consequently, billets that were once coded as Rated Supplement appear to have been changed into

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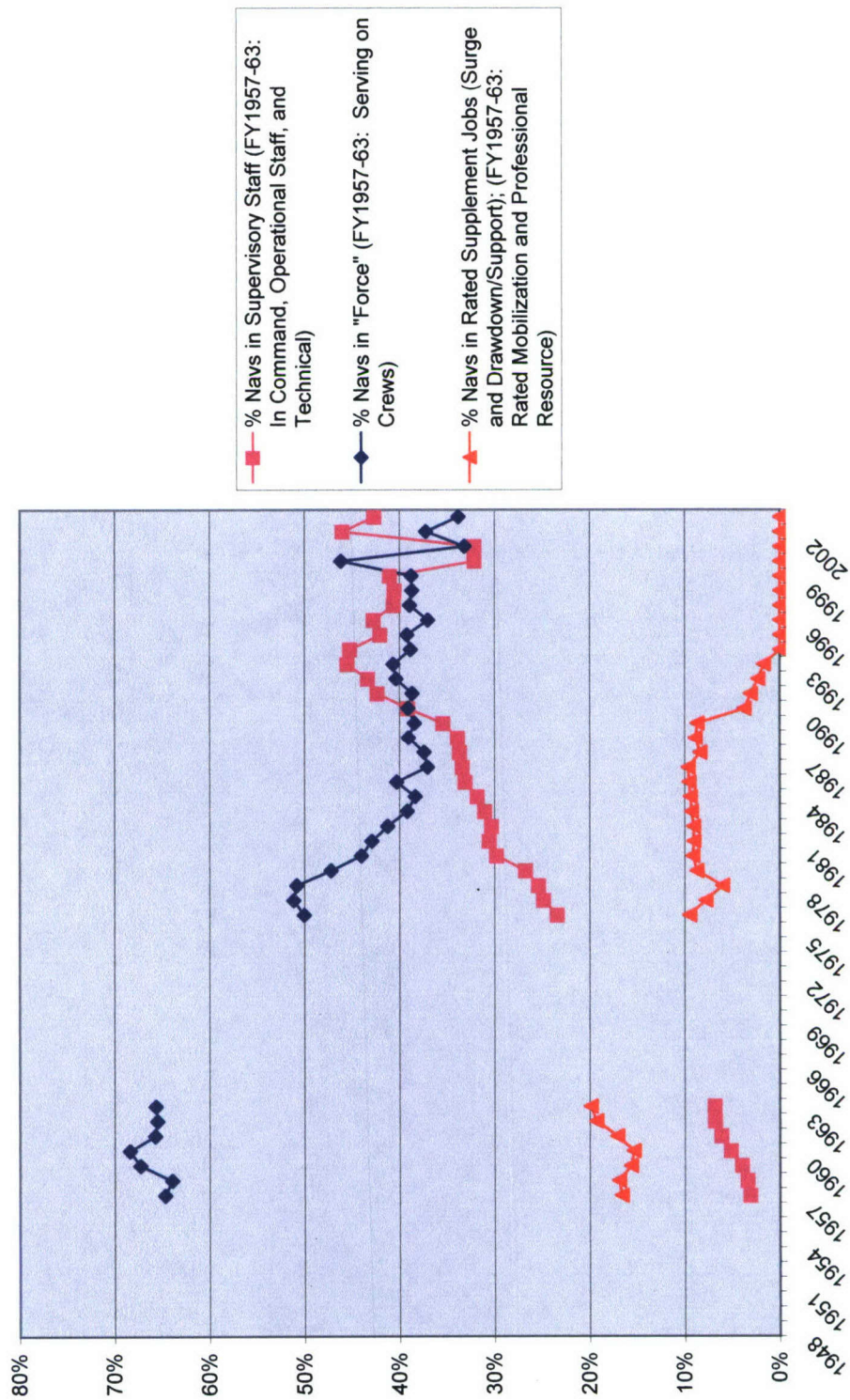
<sup>273</sup> The drops in percentage of pilots and navigators in supervisory staff FY1995 reflect changes in the force, training, advanced student, transient and educational development categories.



**Chart 8-26: Comparison Percentage of Pilots Serving in Various Categories  
(FY57-63 Excludes General Officers (GO))  
(FY1976-FY2003 Excludes GO, Colonel and UPT Students)**



**Chart 8-27: Comparison Percentages of Navigators Serving in Various Categories (FY1957-63  
Excludes General Officers (GO))  
(FY1976-2003 Excludes GO, Colonels, and UNT Students)**





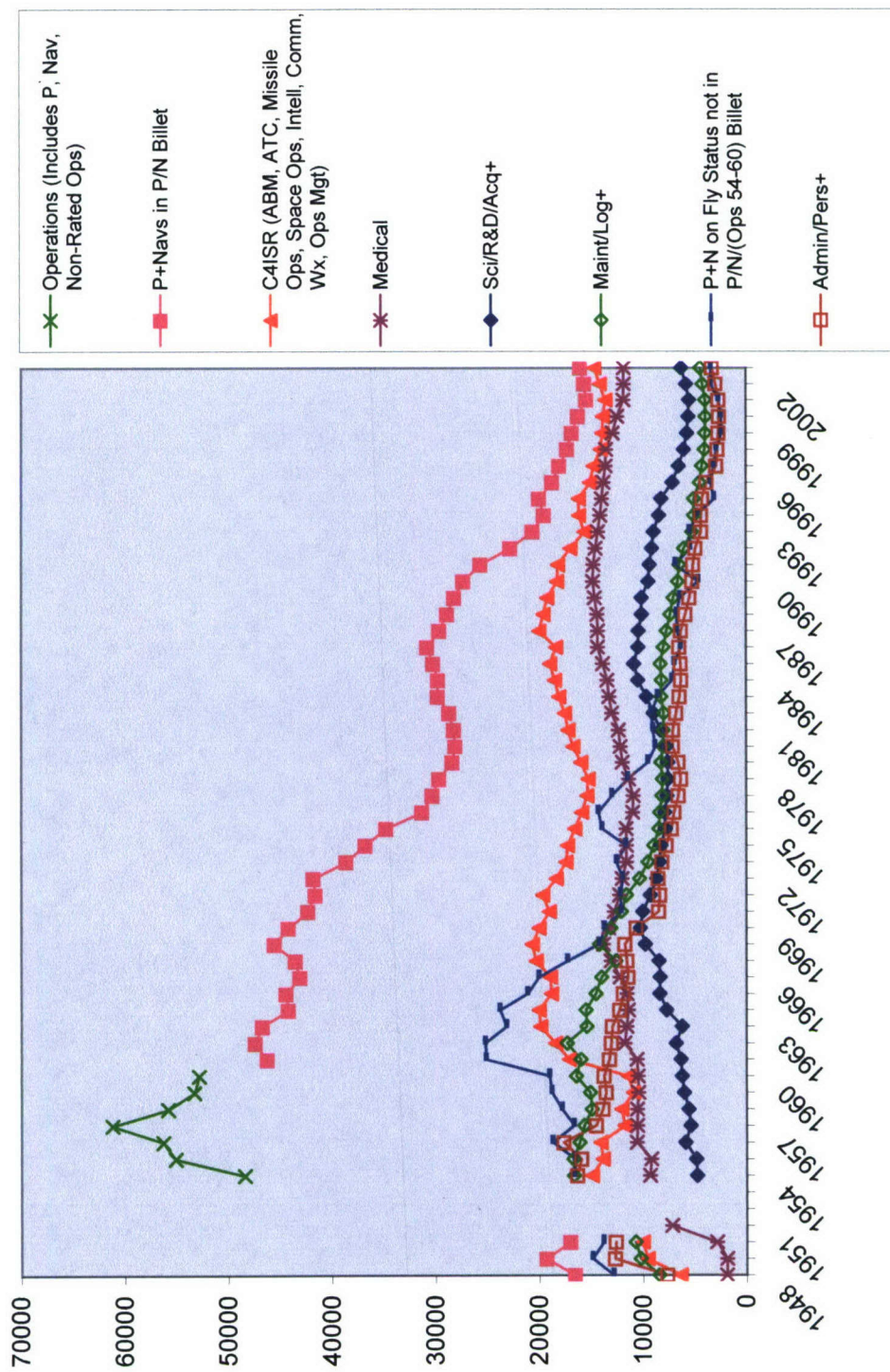
Supervisory Staff pilot and navigator billets on an equal percentage basis. Former surplus billets became required staff jobs.

Chart 8-28 (Comparison of Selected Major AF Officer Occupational Groupings (Includes Pilots and Navs Not in P/N Billets, Double-Counted as Separate Category)) compares the number of pilots and navigators serving in pilot and navigator billets with the numbers of pilots and navigators on flying status not serving in pilot and navigator billets as well as with the number of officers in other amalgamated career groupings. The category of operations/combat billets, used from FY1954-1960 contains the most officers since it holds pilots, navigators and non-rated operators. The category pilots and navigators in pilot/navigator billets is next most populated. The category pilots-and-navigators-on-flying-status-but-not-in-pilot/navigator-billets was initially the second most populated category. That is, there were more pilots and navigators on flying status not serving in pilot and navigator billets than any other career field or career field amalgamation in the officer corps. Furthermore, this category does not contain the pilots and navigators removed from flight status primarily to placate Congress, but still tracked by the Air Force as a reserve rated pool through FY1966. These would add another 8,000 fliers serving in non-flying billets, depending on the year. In addition, the values for the pilots-and-navigators-on-flying-status-but-not-in-pilot/navigator-billets are artificially low for FY1954-1960.<sup>274</sup> It appears to be low by

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<sup>274</sup> I do not have a good way to break out the non-rated operators and have consequently subtracted the total pilots and navigators on flying status from the operations category.

**Chart 8-28: Comparison of Selected Major AF Officer Occupational Groupings**  
(Includes Pilots and Navs Not in P/N Billets,  
Double-Counted as Separate Category)

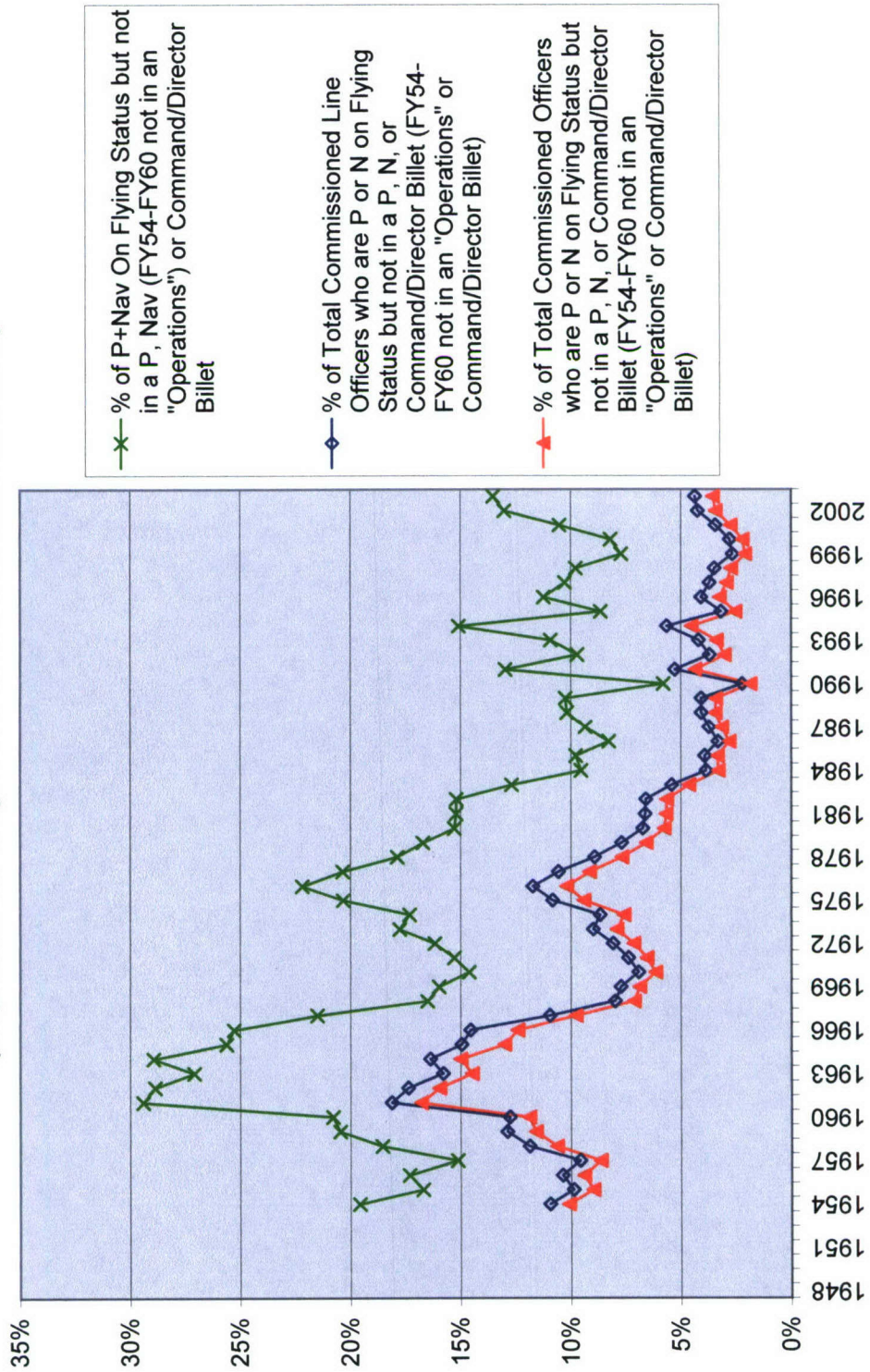




perhaps 7000 officers who actually were non-rated operators. If I had exact numbers, both the operations and the C4ISR categories would increase by roughly that amount. In any event, the pilots-and-navigators-on-flying-status-but-not-in-pilot/navigator-billets category retained its second place position through FY1967, when C4ISR surpassed it. The medical officer and maintenance/logistics+ amalgamations vied with the pilots-and-navigators-on-flying-status-but-not-in-pilot/navigator-billets category at the height of the Vietnam War, but the medical amalgamation did not clearly outman the pilots-and-navigators-on-flying-status-but-not-in-pilot/navigator-billets until FY1979. Maintenance/logistics+ and Administration/personnel+ remained manned at levels relatively close to the numbers of pilots-and-navigators-on-flying-status-but-not-in-pilot/navigator-billets from the end of Vietnam through FY2003. The Science/Research&Development/Acquisitions amalgamation did not surpass the pilots-and-navigators-on-flying-status-but-not-in-pilot/navigator-billets category until FY1983. Consequently, at different times, every billet in any of the line amalgamations or specific non-rated career fields could have been completely manned by fliers on flight status.

As a further example, Chart 8-29 (Comparisons of Pilots and Navs on Flying Status Who Are Not in Pilot, Nav or Command/Director Billets (i.e., Assumes Only

**Chart 8-29: Comparisons of Pilots and Navs on Flying Status Who Are Not in Pilot, Nav or Command/Director Billets  
(i.e., Assumes Only Pilots or Navs in Cmd/Dir Billets)**





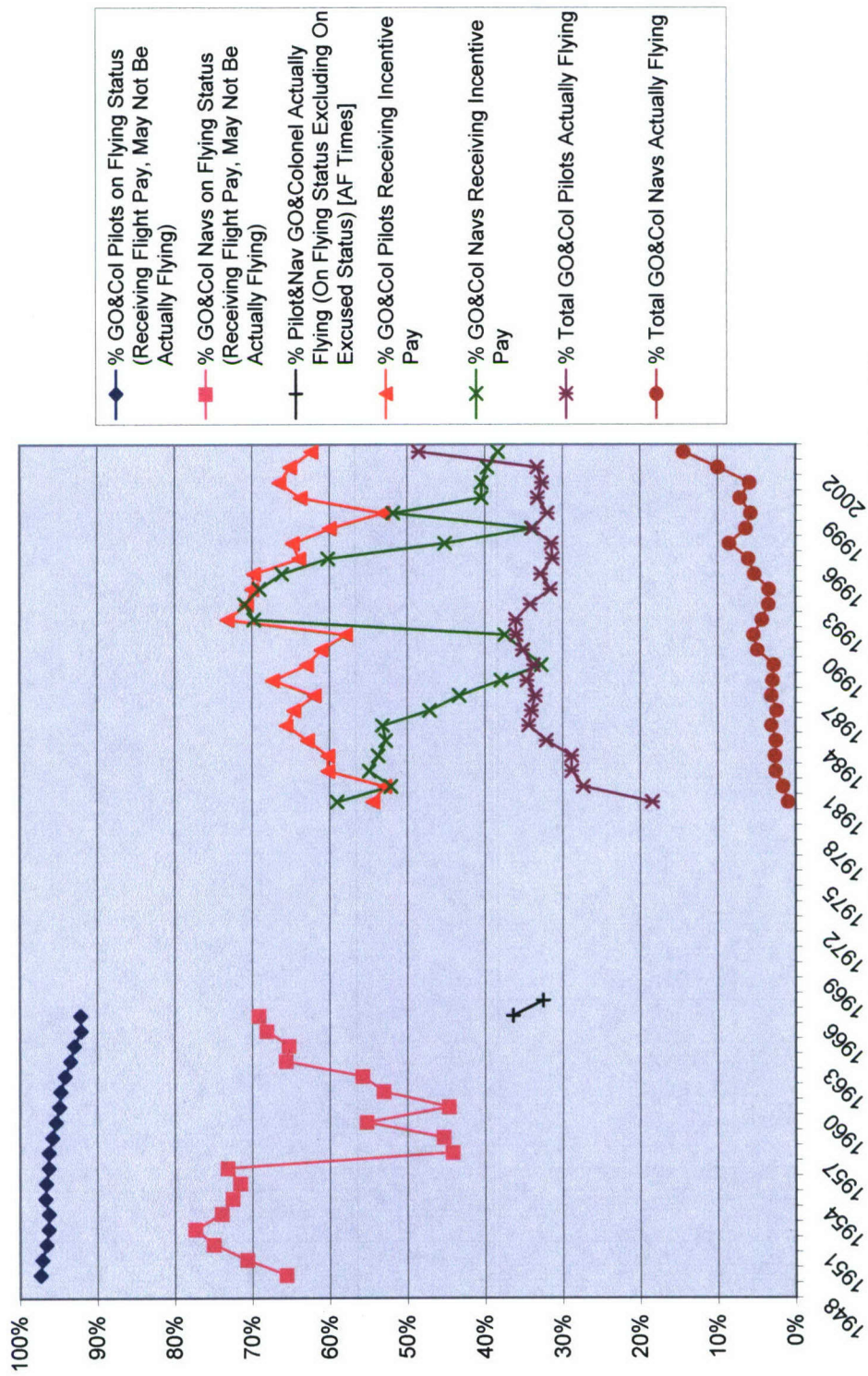
Pilots or Navs in Cmd/Dir Billets)) shows that almost 30% of the non-rated billets in FY1961 were filled by pilots and navigators on flying status. If one assumed that every command/director billet was filled by one of these pilots or navigators, 17% of the remaining line officer billets would still be filled by fliers on flying status in FY1961. In FY2003, fliers on flying status could fill all of the pilot/navigator billets, all of the command/director billets, and still fill another 4% of the line officer billets. Furthermore, 4% of the line officer billets translated to 14% of the pilots and navigators on flying status being surplus after filling all the pilot/navigator and command/director billets. Consequently, it is not clear how the Air Force arrived at its figures that it was 3% (436 pilots) short of pilots, but 13% (558 navigators) over its requirement for navigators in FY2003.<sup>275</sup> If, as the Air Force says, navigators can indeed serve in rated staff billets and commands that ostensibly require pilots, one could argue that there is no shortage of pilots, and a small surplus of 122 rated navigators, which is 0.2% of line officers. Furthermore, if fliers on flying status could fill all the pilot/navigator and command/director billets and still fill another 4% of the line officer billets, it is hard to imagine what the other pilots would be needed for.

Chart 8-30 (Comparison Percentages of Pilot and Navigator General Officers and Colonels Receiving Flight Pay and Actually Flying) indicates that in the current gated flight pay system a historical average for the number of general officer and

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<sup>275</sup> By comparison, using the 3.5:1 and 1.2:1 ratios, the Air Force was 6% short (864 pilots) of pilots and essentially even with navigators.

**Chart 8-30: Comparison Percentages of Pilot and Navigator General Officers and Colonels  
Receiving Flight Pay and Actually Flying**



FY1966/1967 Data on Excused Colonels and Generals from Air Force Times



colonel pilots that are actually in flying positions is roughly one third.<sup>276</sup> The percent of general officer and colonel navigators flying is traditionally much lower, historically below 10%.<sup>277</sup> The data from FY1949-1966 indicates the percentages of the total pilots and navigators on flying status, which included at various times and in various amounts officers serving in front-line flying units flying routinely, officers flying four-hours-a-month-for-proficiency-pay as well as officers on excused status receiving flight pay without flying. The data from FY1966, which overlaps sources, indicates almost two-thirds of these officers were not actually flying in any capacity.<sup>278</sup> Reaching the senior leadership of the officer corps has been historically predicated on flying (pilot) experience, but the majority of the general officer and colonel positions have no required flying duty. Flying wing commands are relatively rare compared to commands

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<sup>276</sup> This correlates loosely with the FY1966-FY1967 data gained by subtracting the general officers and colonels on excused status from the total on flying status, which yielded 36% and 32% respectively. The data on excused general officer and colonels for FY1966 and FY1967 is from the Air Force Times. See "Commercial Aviation Jobs Draw 60 Percent of Pilot Resignees," Air Force Times 24 Aug 1966: 10. The FY2003 spike in pilot general officers and colonels actually flying may be a coding error since there is no apparent basis for the dramatic change.

<sup>277</sup> The picture is different for fliers in the rank of lieutenant colonel and below. Whereas 90% or more of the total pilots and 85% or more of the total navigators in these ranks were traditionally on flight status, most were not in excused status. In fact, the FY1966-1967 data points on excused fliers shows that 91% and 90% respectively of pilots and navigators on flying status were actually flying in some capacity, either in front-line units or in the four-for-pay club. In the gated system, the percentage of lieutenant colonel and below pilots serving in flying units has ranged between 71% and 86%. Navigators, however, continued to be in flying billets at much lower rates, dropping as low as 52 % at times. This was at least partly the result of a general decrease in navigator requirements in flying units combined with a surplus of navigators in field grade ranks. The so-called "graying" of the navigator force.

<sup>278</sup> The data on excused general officer and colonels for FY1966 and FY1967 is from the Air Force Times. The USAF Statistical Digest series provides data on general officer and colonel pilots and navigators on flying status from FY1949 through FY 1966. See "Commercial Aviation Jobs Draw 60 Percent of Pilot Resignees," Air Force Times 24 Aug 1966: 10.

over non-flying units and the host of non-flying staff and other jobs at the general officer and colonel levels.

The final area of discussion in this section deals with two costs associated with keeping a huge pilot reserve within the officer corps. First of all was the issue of money. The four-hours-per-month proficiency flying system in place before the transition to the flying gate system between 1974 and 1977 was expensive. The Air Force had to maintain a fleet of relatively simple aircraft suitable for proficiency flying at all bases where flying was possible. The aircraft required maintenance support, as did the airfields and supporting infrastructure like air traffic control facilities.<sup>279</sup> There were also increased personnel costs to consider. The Senate Appropriations Committee reported in late 1975, that the defense appropriations bill's:

Long-term goal is to eliminate proficiency flying and achieve the associated economies not only in flying hours and maintenance costs, but the economies that would result from not taking time away from an individual's primary job duties for proficiency flying.<sup>280</sup>

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<sup>279</sup> For example, Maxwell Air Force Base kept 54 aircraft and about 255 maintainers and spent about \$2 million per year just for student proficiency pay so that students would not lose flight pay while attending Squadron Officers School, Air Command and Staff College, Air War College, or other longer courses offered at Maxwell. These aircraft, maintainers and money were in addition to those needed to support fliers serving as instructors, staff and permanent party at Maxwell AFB. See Bruce Callander, "Rated Force Freed From Four-for-Pay," *Air Force Times* 17 Aug 1966: 43.

<sup>280</sup> "Proficiency Flying in Jeopardy," *Air Force Times* 3 Dec 75: 10. The German *Luftwaffe* continues to use a proficiency flying system; so fliers must periodically disappear from staff jobs at all levels to get their required flight time. The German fliers maintain their proficiency with their previous unit and stay current in the aircraft, which requires much more involvement than the Air Force's four-for-pay in simple, non-combat aircraft. Nevertheless, non-rated officers serving on the same staffs are invariably suspicious when fliers coincidentally need to go fly for proficiency when major projects require lots of overtime.



The second issue concerns the role of the reserve forces. Besides losing the flier for brief periods when he was proficiency flying, if the fliers really provided a reserve, calling out that reserve in mass would result in a large number of personnel holes in various Air Force organizations. Someone would conceivably need to back-fill the staff and non-rated positions so that the Air Force's war effort would smoothly continue as fliers were pulled back to aircraft. During the Vietnam War, the Air Force portrayed its pool of excused and proficiency fliers as a boon. Taking these fliers out of non-flying jobs and putting them back into active flying jobs minimized the call-ups of Air Force Reserve and Air National Guard pilots. In addition, using the excused and four-hours-a-month fliers reduced the need for active duty full-time fliers to serve multiple tours in Southeast Asia. However, the long-standing use of rated officers in non-rated billets meant that there was a shortage of non-rated officers to quickly fill billets vacated by rated officers.<sup>281</sup> Using Air Force Reserve or Air National Guard officers to fill these non-rated slots ran counter to the Air Force's claim that the excused and proficiency pilots eliminated the need to call-up the real reserves.<sup>282</sup> However, in the post Vietnam

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<sup>281</sup> "Pilot Manning Problems: Other Areas Affected," Air Force Times 9 Apr 1969: 5. In May 1967 the Air Force Times was even more boisterous in the Air Force's defense of its flier "reserve." "For the first time in history, it was able to meet a shooting war emergency without calling up Reserves, holding fliers involuntarily or lowering standards to expand pilot production in a hurry." See "AF Restores 'Pilot' Image," Air Force Times 24 May 1967: 4. Reserve pilots were later called-up and the Air Force did institute a stop-loss for pilots. See Ed Gates, "Pilot Losses Drop Sharply," Air Force Times 22 May 1968: 1.

<sup>282</sup> In the post Vietnam drawdown in the mid-1970s the Air Force dumped over 10% of its pilots on flying status into the "Rated Supplement" program, putting the excess pilots in non-rated jobs. The Air Force planned on using Reserve Supplement Officers (RSOs) to backfill the billets if the pilots returned to combat cockpits in time of war. However, the Air Force Reserve reported resistance to training the RSOs. Perhaps there was no point in training RSOs if the rated supplement pilots they were to replace

world, the military shifted its perspective on the reserve forces. The new emphasis was on drawing the reserves into battle as soon as possible as a way to force Congress and the American people to decide early on to support a war or stop it before it became another Vietnam-style political morass. Consequently, in hindsight at least, the Air Force officer corps' portrayal of the excused and proficiency flier pool as a substitute for the real reserves appears misguided. Even at the time, the concept conflicted with the purpose of the Air Force Reserve and Air National Guard. In theory and in practice, the Reserves and Guard have been activated in times of emergency to provide aircrews, maintainers and aircraft in unit sets.<sup>283</sup> Finally, maintaining a buffer of reserve pilots without aircraft for them to fly makes no sense, given the cost and time required to produce modern military aircraft.

The data is clear that the Air Force officer corps has increased its reliance on non-rated officers, at least up to the colonel level, to provide expertise and leadership in non-flying fields. This implies that as the officer corps continues to shed aircraft, the number of pilots that it actually needs will decrease. Simultaneously, the trend is that the ratio of non-rated officer per aircraft will continue to increase, which would make pilots an even smaller percentage of the officer corps. This will be complicated by issues such as how to classify unmanned combat aerial vehicles, but the trend in

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were not particularly well trained. See "Systems Command Draws Top Number: Rated Supplement Quotas Listed," *Air Force Times* 6 Aug 1975: 21.

<sup>283</sup> The mixing of crews and aircraft between active and reserve forces as is done with cargo aircraft, AWACS and JSTARS for example, reinforces the point that the Air Force Reserve and Air National Guard are the Air Force's reserves. The reserve is not supposed to be an amorphous group of pilots serving in non-rated billets in the active forces.



requirements is clear. What is not clear from the data is whether the officer corps can ignore its natural preference to have more pilots than it needs, especially at higher ranks. The flight pay and bonus systems continue to provide incentives for pilots to stay in the Air Force and occupy senior non-flying positions. This continues to limit non-pilot opportunities at the general officer rank. We now turn our attention to the field grade officer promotion system to see if it is another contributor to the pilot overrepresentation at the general officer ranks.

### Promotion System Bias

The final section of this chapter examines field grade promotions for bias favoring pilots or rated officers.<sup>284</sup> Chapter 7 discussed the historical impact of the

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<sup>284</sup> This section specifically addresses the promotion system, but there was also a historical bias favoring pilots in the awarding of *regular* commissions. For example, in 1940, over 97% of the Air Corps officers with regular commissions were pilots. Officers with reserve commissions selected for augmentation to the limited number of regular commissions were presumed to be the best and the ones that the officer corps wanted to keep for careers in the Army Air Corps. In short, they were pilots. This presumption continued within the independent Air Force. Despite a decision in 1947 to end the practice of tendering regular officer commissions at the ratio of 70% for rated officers and 30% for non-rated officers, rated officers continued to be rewarded. See Mitchell, p. 353. In FY1951, 56% of the Air Force officers with regular commissions were pilots, although the percentage of total officers who are pilots had already fallen to 44%. In 1952, when only 303 regular officer commissions were extended, 90% went to rated officers, and in 1958, when a massive augmentation practically doubled the size of the regular officer component, rated officers still garnered over 70% of the regular officer commissions. See Mitchell, p. 341. The status issue between having a reserve commission and being expressly selected and rewarded with one of the limited number of regular commissions, had obvious implications as a sorting tool for use by promotion boards—an Air Force professional board had already indicated a desire to keep (and promote) the officer with the regular commission. Furthermore, since an officer with a regular commission was able to serve beyond 20 years of active duty tenure, he was conceivably a better investment for things like attendance at intermediate and senior service schools than a reservist facing termination at 20. Attending the schools, however, also increased an officers promotion chances, thereby continuing the inequities.

The complicated system of regular and reserve commissions is not addressed in this manuscript because the system changed over time, to the point that all officers serving on active duty start with regular commissions beginning in FY2006, which will effectively end the dual system of commissions. Previously, however, the number of regular commissions was limited, and the Air Force established

tradition that 90% of the officer corps should be pilots as well as the glass ceiling over non-pilot officers imposed by the law that only pilots could command flying units and the current policy that only rated officers can command flying units. This chapter has already examined the impact of the Aviation Cadet Program's emphasis on flying and the officer corps' tradition of building an active duty pilot reserve in non-rated billets.

These factors contribute to an obvious bias in the promotion system favoring pilots.

Furthermore, the basic question of this manuscript, why pilots are so overrepresented in the general officer ranks, indicates inherent promotion system bias. Chart 8-31

(Comparison Percentages per Field Grade and General Officer Ranks are Pilots on

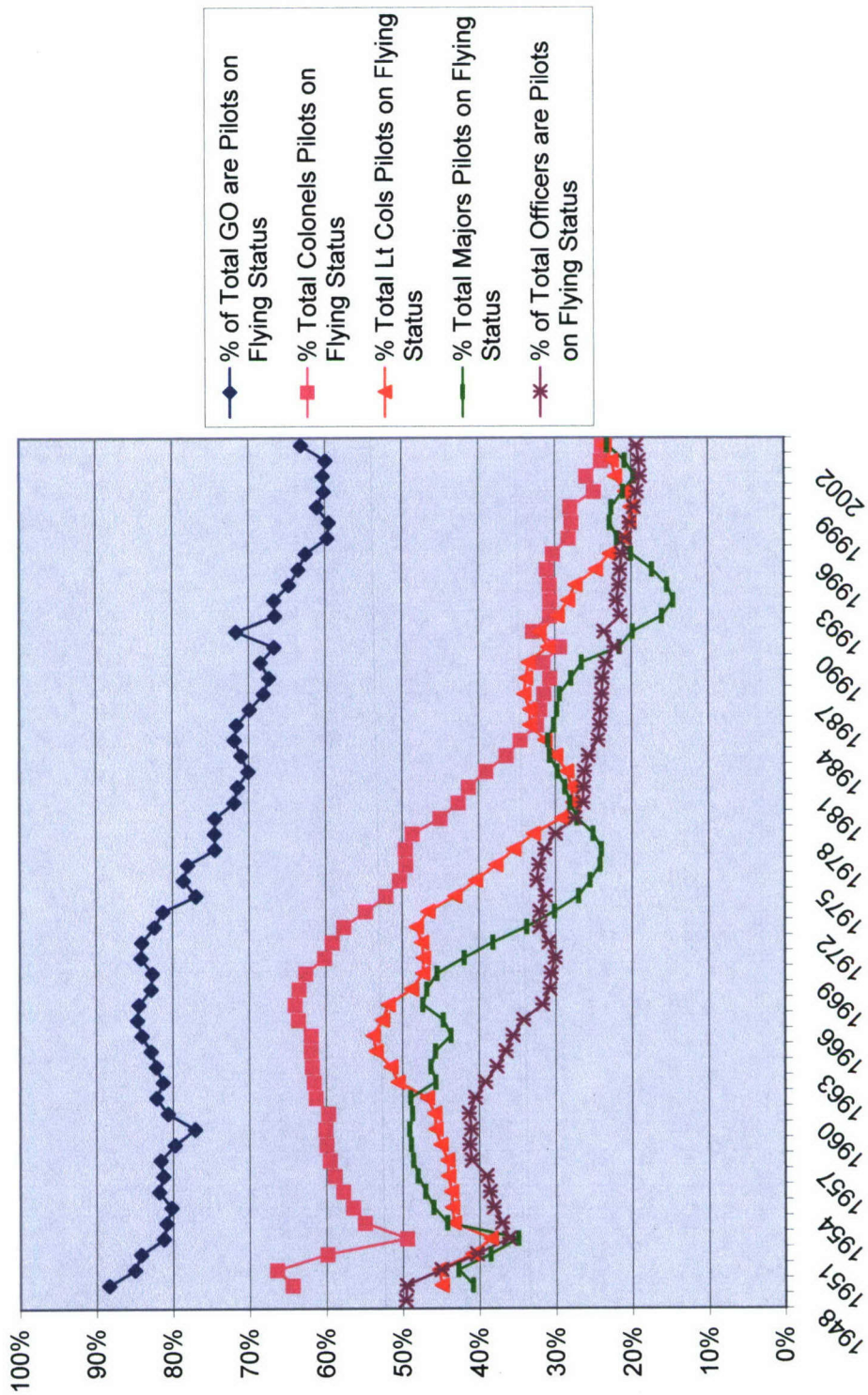
Flying Status versus Percentage of Total Officer are Pilots on Flying Status) shows the

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allocations based on officers' rated status as a tool to manage the projected future proportions between pilots, navigators and non-rated officers. The Air Force consistently maintained that active duty officers with regular commissions were not given an advantage or an allocation of field grade promotions. However, they tended to be promoted at higher rates because they were better than their peers, as evidenced by their previous selection to regular over the generally same peers. In the earlier years, pilots tended to be awarded regular earlier than non-rated officers. This allowed a natural selection of sorts to take place as the better pilots in a given year group were presumably already regular, and many non-rated officers had already separated before the bulk of the non-rated officers were considered. Later, this was flip-flopped in an effort to indicate to non-rated officers whether they were career material before they ended their initial service obligations. Rated officers had more time because they had longer service commitments. Regular officers were essentially guaranteed a career. Whereas officers on active duty with reserve commissions had two opportunities for promotion to temporary rank before being separated, officers with regular commissions had two temporary and two regular opportunities, which traditionally came later, to be selected for promotion. In addition, officers with regular commissions were not liable for involuntarily separation before being eligible for retirement if there was a reduction in force levels. Until the 1990s, regular commissions were automatically granted to service academy graduates, the majority of whom became pilots in the Air Force, and sometimes to outstanding ROTC and OTS graduates upon graduation. The majority of the regular commissions, however, were awarded by promotion-type boards, which occurred at various intervals during an officer's career. As the military moved away from the two-track system of commissions, some of the intervening steps involved granting regular commissions to all officers promoted to major, and eliminating the granting of regular status to academy and other officer training graduates. See for example, Lee Ewing, "Regulars 'Generally Better' Jones on Records of Officers," *Air Force Times* 1 Mar 1976: 3; George Foster, "Promotion Edge in RegAF Denied," *Air Force Times* 21 Jan 1970: 1; or Ed Gates, "2469 Will Receive Selection for RegAF," *Air Force Times* 8 May 1968: 1.



**Chart 8-31: Comparison Percentages per Field Grade and General Officer Ranks are Pilots on Flying Status versus Percentage of Total Officers are Pilots on Flying Status**



percentages of total general officers, colonels, lieutenant colonels and majors who are pilots on flying status with a comparison to the percentage of total officers who are pilots on flying status. The difference in the percent of general officers who are pilots on flying status versus the percent of total officers who are pilots on flying status has varied, but it generally remains between 40% and 50%. Consequently, this 40-50% overrepresentation of pilots on flying status in the general officer ranks remains real, even as the overall percent of pilots on flying status in the Air Force officer corps shrank.

Furthermore, the chart indicates a general trend that the differences between the percentages of field grade officers who are pilots on flying status is approaching the percentage of total officers who are pilots on flying status. That is, the overrepresentation of pilots in other ranks is shrinking, while it remains constant in the general officer ranks. This is particularly apparent in the rank of colonel, which earlier formed a step between the general officer percentages and the percentages of the other ranks. Previously there was a semblance of a general pattern indicative of a gradual weeding out of non-pilots (or higher promotion rates for pilots) through the progression of ranks. Higher percentages of pilots would be promoted in step-wise fashion, culminating in a final weed-out at the general officer level. The colonel rank retained this position until roughly FY1984 when the difference between the percentage of total officers who are pilots on flying status and the percentage of total colonels who are pilots on flying status fell below 10%. From that point onwards, the semblance of a



step-wise building of the pilot overrepresentation disappeared as the percentages of colonels, lieutenant colonels and majors who are pilots on flying status began to approach one another and even overlap in the lieutenant colonel case. From FY1997 on, the proportion of field grade officers who are pilots on flying status appears to be consolidating in the 20-25% range. This still indicates a pilot bias, but it also indicates that the over-proportional promotion of pilots now occurs primarily in one fell swoop between colonel and brigadier general.

This is noteworthy because general officers sit on the promotion boards that decide which officers are promoted to colonel and the general officer ranks, and colonels man the promotion boards that select officers for promotion to the ranks of captain through lieutenant colonel. Consequently, generals as a group, have used promotions to lower the representation of colonel pilots on flying status to a level approaching the Air Force average, but have not done the same in their own ranks. Historically, colonels had been doing the same thing. Even though the colonel ranks were proportionally overrepresented by pilots on flying status, the percentage of pilots on flying status in the ranks of lieutenant colonel and major colonel ranks were kept at a much lower rate until the early 1980s when the percentage of colonel pilots decreased towards the percentage of total officers who are pilots.

The chart also indicates higher levels of variation in the percentages of majors and lieutenant colonels who are pilots on flying status. In fact, the percentage of majors who are pilots on flying status dipped below the percentage of total officers who are

pilots several times for many years. The percentage of lieutenant colonels who are pilots on flying status has also been below or close to the percentage of total officers who are pilots several times. It has also exceeded the percentage of colonels who are pilots on flying status from 1985-1990. Consequently, one would expect to see more variation in promotion data bias for promotions to major and lieutenant colonel than for colonel. Finally, since the bias is obvious in the colonel promotions, and to a lesser extent in the major and lieutenant colonel ranks, from 1949-1984, the most interesting time period is from the mid-1980s onward, when there is less apparent systemic bias.

The promotion data will be analyzed in three different ways for each rank (major, lieutenant colonel, colonel).<sup>285</sup> The first will be a look at in-primary-zone (on-time) promotions to the ranks of major, lieutenant colonel, and colonel broken out by rated versus non-rated officers. The second will be a look at below-primary-zone (early) promotions to the same ranks, again by rated versus non-rated officers.<sup>286</sup> The third will use difference of proportions to determine if there were statistically significant differences between the promotions rates of rated versus non-rated offices as well as for pilots versus all other line-officers for in-primary-zone and below-promotion-zone boards from 1989-2003 for the ranks of major, lieutenant colonel and colonel.

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<sup>285</sup> The Air Force officer corps has traditionally not provided much data on general officer promotion boards beyond the list of who was selected for promotion.

<sup>286</sup> Officers are also considered after-primary-zone, i.e., they can be selected for promotion later than their peers. However, the percentages of officers who are promoted this way are quite small, roughly the size of the below-primary-zone numbers, but without the same future prospects.



Below-primary-zone selections are particularly important because the extremely small number of officers promoted early are identified as “fast burners” and are often given further promotable jobs, which leads to a cascading effect if they are promoted early through successive ranks. For example, an officer entering the Air Force as a 2<sup>nd</sup> lieutenant in the early 1980s could have been promoted two years early to major, two years early to lieutenant colonel and two years early to colonel, arriving at the rank of colonel six years earlier than his original peers. The numbers of below-primary-zone promotions tend to represent a selection pool equal to two to three times the annual number of brigadier generals selected, leading to the conclusion that they form the inner pool of contenders for promotion to brigadier general.<sup>287</sup> The below-primary-zone promoted officers are also considered to be in a grooming process for that selection. Although they assume positions of responsibility with attendant risks of failure earlier, officers with multiple below-primary-zone promotions tend to move more often and spend less time in their duty billets. This exposes them to more aspects of the Air Force, but limits their opportunities for both failure and learning at each duty station. They then appear more rounded and experienced than their primary-zone colleagues, which in theory keeps them on the promotion fast track. Consequently, below-primary-zone (early) promotions indicate a separate, less-traveled inside track that provides a better explanation than on-time promotions of the bias in promotion to general officer rank.

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<sup>287</sup> George Foster, “6472 New Majors, 5829 Go Up On First Try,” Air Force Times 18 Jun 1969: 4.

The discontinuous data on Chart 8-32 (Comparison Number Rated Versus Non-Rated Line Officers Considered for In-Primary-Zone (On-Time) Promotion to Major) and Chart 8-33 (Comparison Number Rated Versus Non-Rated Line Officers Selected for In-Primary-Zone (On-Time) Promotion to Major) indicate that more rated officers were considered and selected for promotion to major until the mid-1970s. From 1989 through 2003 the number of non-rated officers, which includes officers no longer on flight status, exceeds the number of rated officers considered and selected. However, Chart 8-34 (Comparison of Selection Rates for Rated Versus Non-Rated Line Officers for In-Primary-Zone (On-Time) Promotion to Major) shows that in each case, the selection rate for rated officers is higher than that of non-rated officers. Switching to the Below-Primary-Zone data for promotion to major, Chart 8-35 (Comparison Number Rated Versus Non-Rated Line Officers Considered for Below-Primary-Zone (Early) Promotion to Major) indicates that an equal number of rated and non-rated officers were considered for below-primary-zone promotion to major in FY1976, and three times or more non-rated than rated officers were considered for below-primary-zone promotion to major from 1989 to 1998, the last Air Force below-primary-zone promotions to major.<sup>288</sup> However, Chart 8-36 (Comparison Number Rated Versus Non-Rated Line Officers Selected for Below-Primary-Zone (Early) Promotion to Major) shows that non-

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<sup>288</sup> The Air Force stopped the below-primary-zone promotions to major on the grounds that there was little real basis for distinguishing between candidates (pilots were spending more time in the cockpit, and promotion to major was coming early in an officer's career), and because it wanted to slow down the fast track process. Officers becoming colonels six years "below-the-zone" often had great breadth, but no depth.



Chart 8-32: Comparison Number Rated Versus Non-Rated Line Officers Considered for In-Primary-Zone (On-Time) Promotion to Major

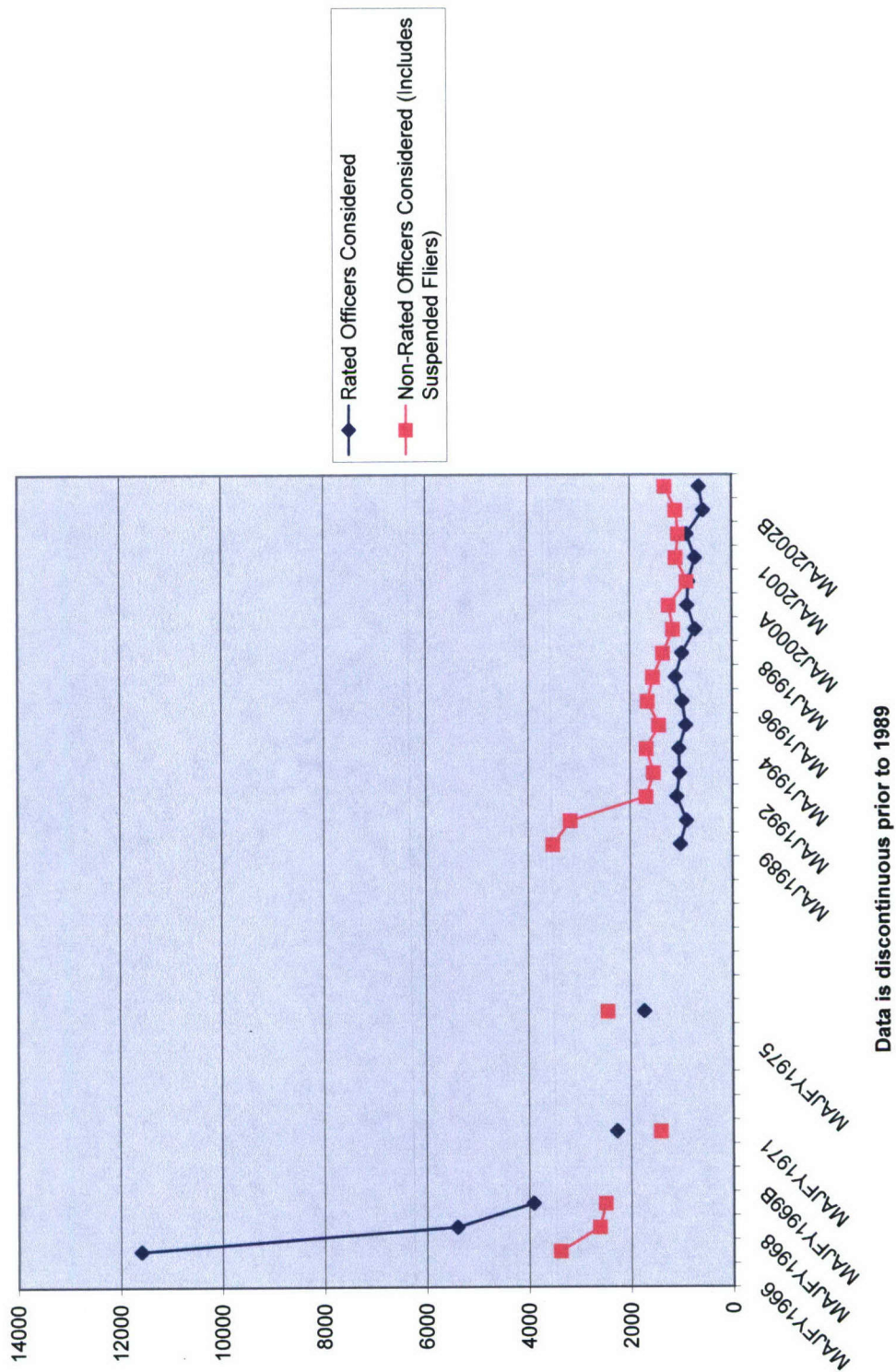
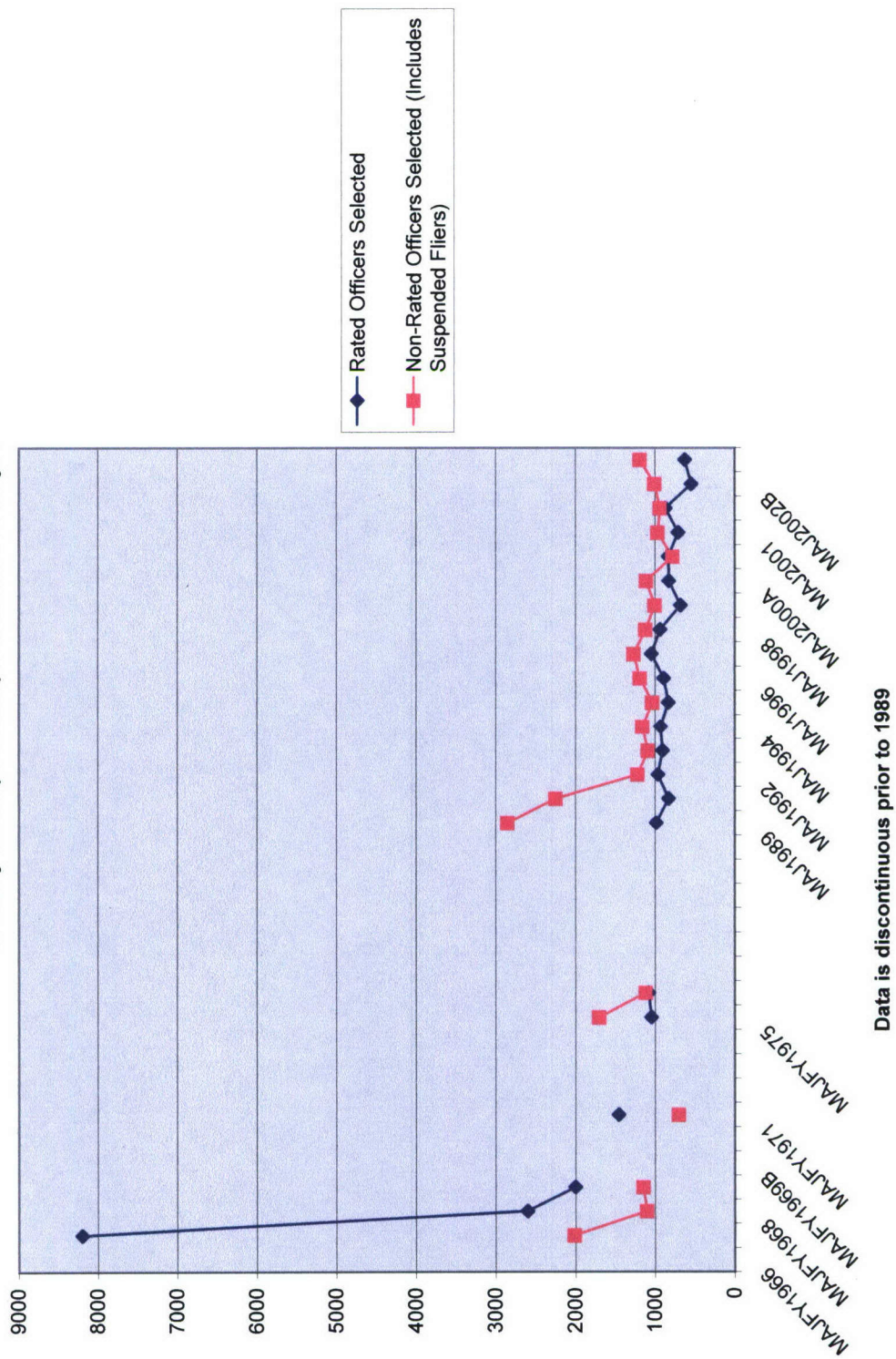
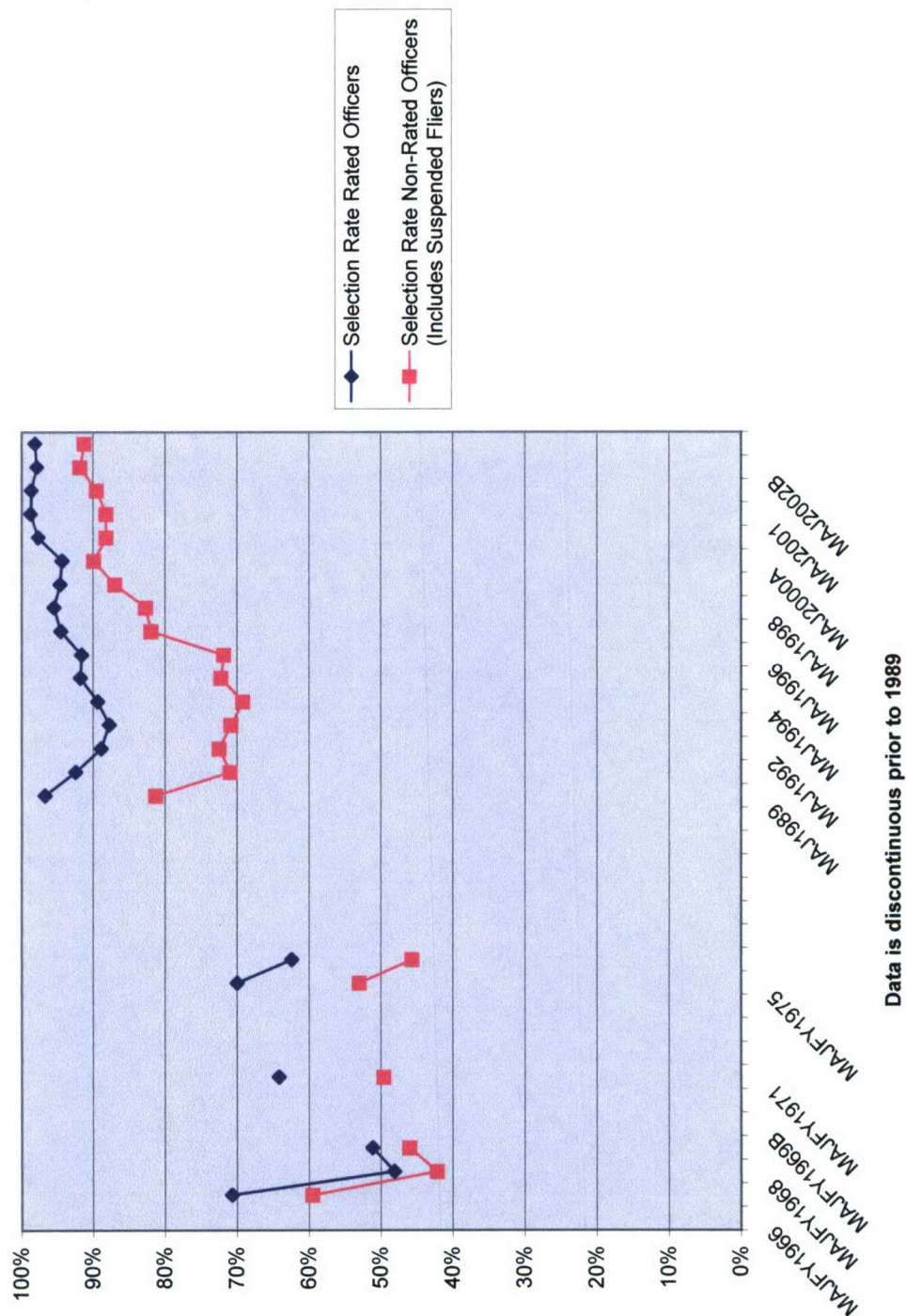


Chart 8-33: Comparison Number Rated Versus Non-Rated Line Officers Selected for In-Primary-Zone (On-Time) Promotion to Major

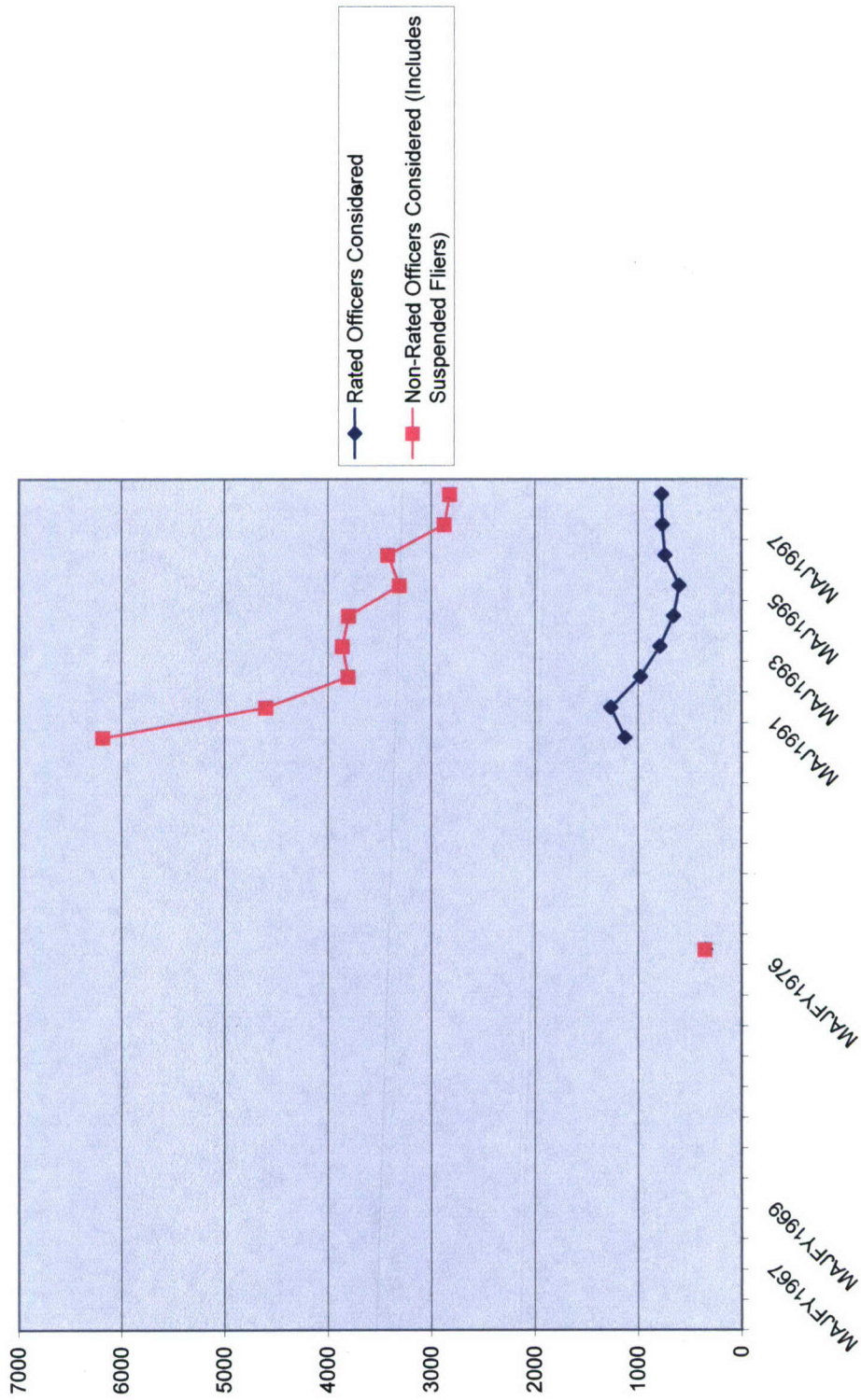




**Chart 8-34: Comparison of Selection Rates for Rated Versus Non-Rated Line Officers for In-Primary-Zone (On-Time) Promotion to Major**



**Chart 8-35: Comparison Number of Rated Versus Non-Rated Line Officers Considered for Below-Primary-Zone (Early) Promotion to Major**

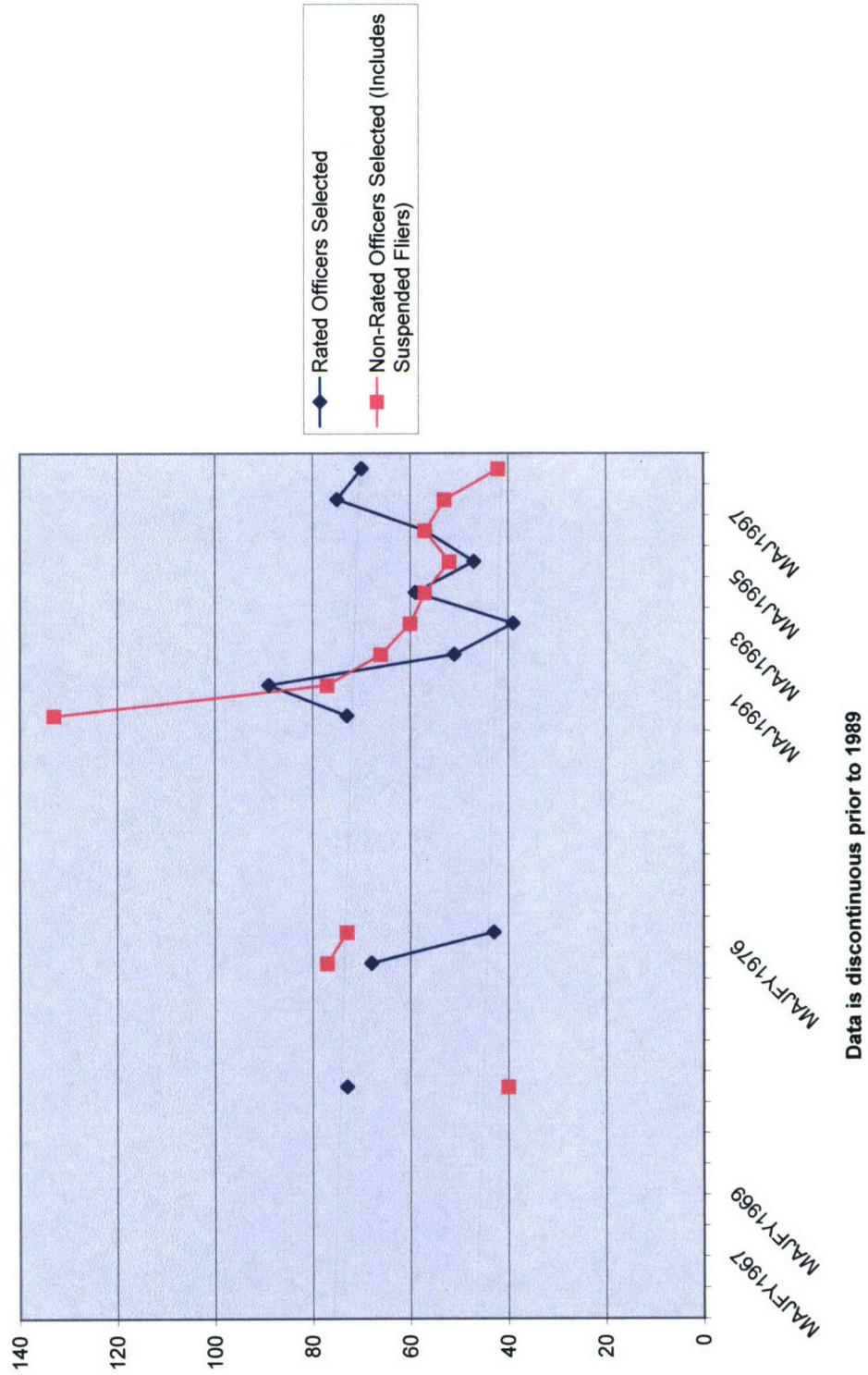


Data is discontinuous prior to 1989

Data is discontinuous prior to 1989



Chart 8-36: Comparison Number Rated Versus Non-Rated Line Officers Selected for Below-Primary-Zone (Early) Promotion to Major



rated officers were not selected in the same overwhelming numbers between 1989 and 1998. Non-rated officers were selected in greater numbers in the 1975 and 1976, though. In terms of selection rates, Chart 8-37 (Comparison of Selection Rates for Rated Versus Non-Rated Line Officers for Below-Primary-Zone (Early) Promotion to Major) the non-rated officers did better in the mid-1970s, and rated officers did noticeably better from 1989 through 1998. With respect to the statistical significance of the differences between the rated and non-rated promotion rates for in-primary-zone and below-primary-zone promotions to major, Chart 8-38 (Comparison Line Major In-Primary-Zone (On-Time) and Below-Primary-Zone (Early) Differences of Proportion, Rated vs Non-Rated) shows that for all data points except the FY1976 below-primary-zone rate, rated officers were promoted at statistically significant rates above non-rated officers. In the FY1976 below-primary-zone board, however, non-rated officers were promoted at a statistically significant higher rate than rated officers. This board was unique because it was the only below-primary-zone major's board in which roughly equal numbers of rated and non-rated officers were considered.

From 1989 on, the number of non-rated officers considered for below-primary-zone promotion to major greatly exceeds (ranging from 6:1 in 1989 to 3:1 in 1988) the number of rated officers considered. More non-rated officers were being considered for below-primary-zone promotion to major because they had better records and did better at the major command screening boards. As the rated officer initial commitment and back-to-back early cockpit tours climbed, rated officers had less opportunities for staff



**Chart 8-37: Comparison of Selection Rates for Rated Versus Non-Rated Line Officers for Below-Primary-Zone (Early) Promotion to Major**

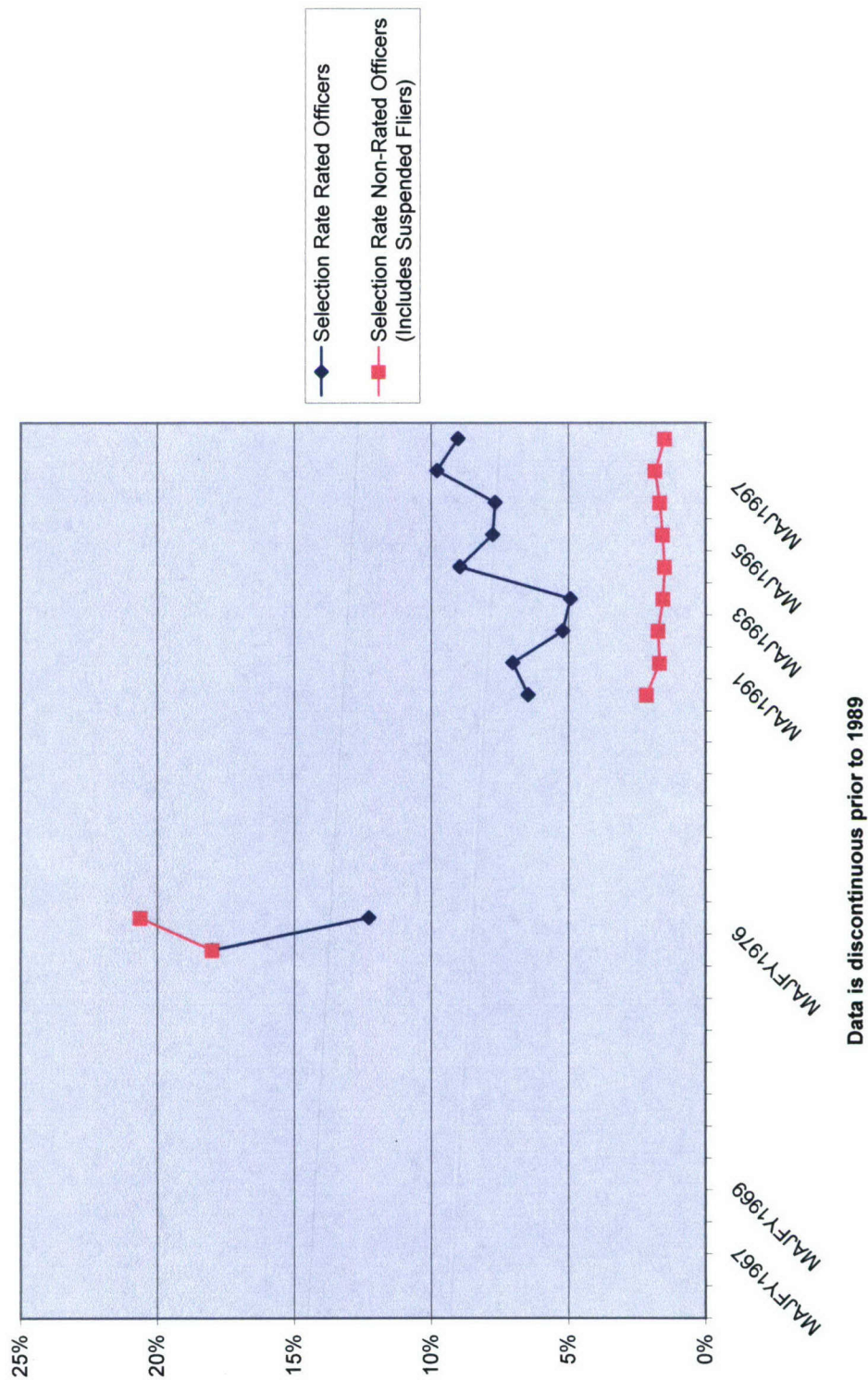
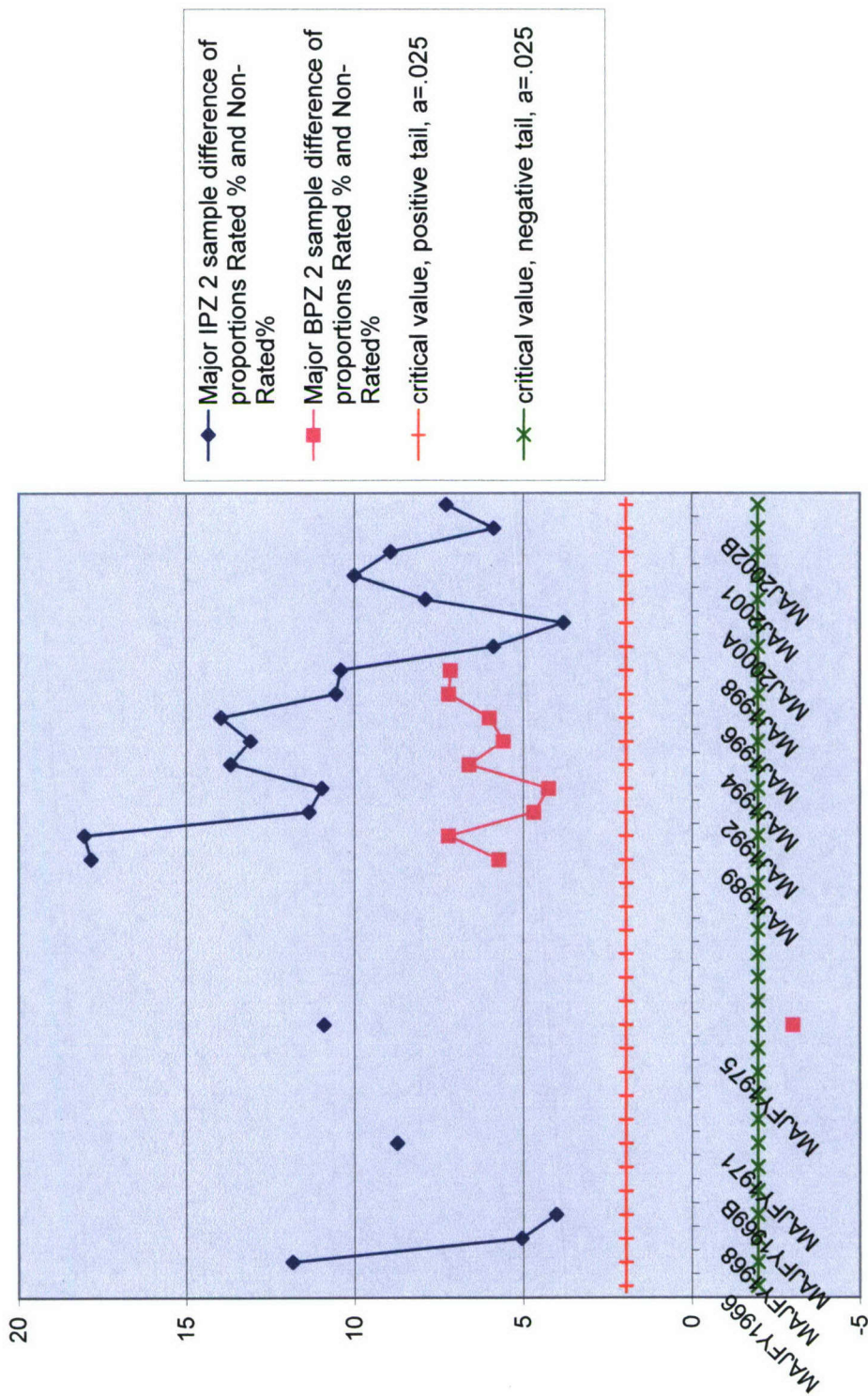


Chart 8-38: Comparison Line Major In-Primary-Zone (On-Time) and Below-Primary-Zone (Early) Differences of Proportion, Rated vs Non-Rated



Data is discontinuous prior to 1989  
Discontinuous Data Until 1989



and other non-flying jobs before coming up below-primary-zone consideration. Rated offices spent most of their time flying, and their records were largely indistinguishable. Non-rated officers, however, had more opportunities for command positions over enlisted personnel, and often migrated into staff positions earlier. Consequently, larger numbers of non-rated captains had records with distinguishing characteristics such as command over a large maintenance or security police section and/or staff positions with responsibility for major programs and resources.<sup>289</sup> As a class, these non-rated officers obviously did better at the major command screening boards, being pushed forward to

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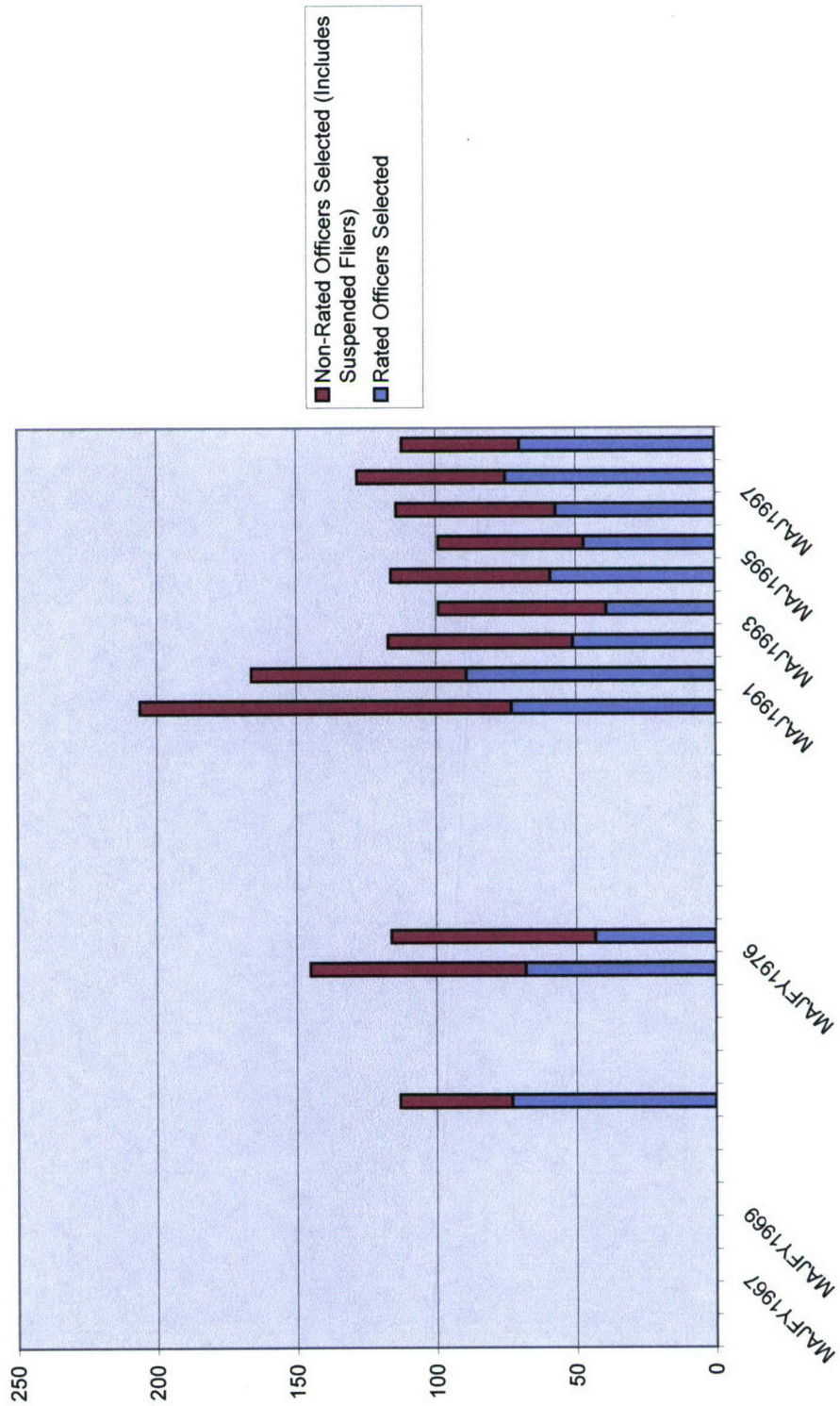
<sup>289</sup> Officers are not eligible for selection to attend command and staff college until being promoted to major; so this was not a distinguishable factor. Most officers were sent to Squadron Officer School, so this also should not have been a decision factor, and both rated and non-rated officers could equally sign up and take courses for a master's degree. However, as pilots began to be deployed more to police no-fly zones and participate in operations in Southwest Asia and in the Balkans, the Air Force decided to mask an officer's postgraduate education level. This was done because deployed officers had a harder time earning master's degrees, which might put pilots at a disadvantage in promotion boards. This was not an issue previously when, for example, other specific career fields like air battle managers had very high deployment rates in the 1980s. In 1995 the Air Force removed all references to off-duty civilian education from officer promotion records for promotion to captain and major, but retained it for promotion to lieutenant colonel and colonel. The justification was that not all junior officers had the same opportunity to earn off-duty degrees; while lieutenant colonels, colonels and general officers "require the maturity and exposure provided by advanced studies." See Bryant Jordan, "Promotion-folder change: Advance degrees lose luster for captains, majors," *Air Force Times* 15 Jan 1996: 10. By 1999 it was clear that the promotion boards were not just using master's degrees and PME completion as tie breakers, but as promotion criteria. Officers with "definite promote" recommendations, which were limited to a small percentage of the officers being considered for promotion, were not being promoted because they either did not have advanced degrees or had not completed the normal level of PME for their rank. See Bryant Jordan, "Education no longer make-or-break criterion for promotion: Ops temp prevented officers from getting degrees and PME," *Air Force Times* 6 Sep 1999: 10. In February 2005 the Air Force finally eliminated all references to off-duty civilian education from officer promotion records to all grades, ostensibly because the boards gave too much weight to having, or not having a master's degree, and not enough to whether it was useful to the officer or to the Air Force. See Rod Hafemeister, "A new degree of anonymity: Civilian education to be hidden from promotion boards," *Air Force Times* 14 Feb 2005: 13. However, the Air Force quickly reversed that policy, announcing in April 2006 that officer civilian education will once again be part of the promotion records starting in January 2008. Apparently too many officers stopped pursuing academic degrees on their off-duty time, and those that did wanted credit for it. See Rod Hafemeister, "Officers: Your civilian education is showing," *Air Force Times* 1 May 2006: 10.

the actual below-primary-zone board at rates exceeding 3:1 over their rated peers, but nonetheless doing much more poorly where it most mattered—at the promotion board. It is possible that the rated officers selected for below-primary-zone were a small, special group of rated officers with truly extraordinary records that stood both above all other rated as well as non-rated records. In this case, this could indicate an earlier fast-track selection process whereby only a very small, select group of rated officers were chosen and moved into positions that engendered outstanding records. They might also have been war heroes of some sort in Dessert Storm or the post war aerial occupation of Iraq. Or there could simply have been a professional bias favoring rated over non-rated officers at the boards. All three explanations are based on a bias of some sort. The only difference is who and where the bias is exhibited.

Although the selection rates are important and possibly indicate historic trends of preferential treatment for rated officers, the actual numbers of rated versus non-rated officers promoted below-primary-zone are important because they set the baseline for identified fast-burners, who theoretically would be given more challenging jobs lining them up to stay on the fast track for future promotions. Chart 8-39 (Comparison Number Rated Versus Non-Rated Line Officers Selected for Below-Primary-Zone (Early) Promotion to Major (Bar Graph)) illustrates the numbers of officers selected for this fast track. The 1975, 1976 and 1989 discontinuous data show non-rated officers in clear majorities, reaching approximately a 2:1 ratio over rated officers in 1976 and 1989. However, from 1994 on, the number of rated to non-rated officers joining the fast



**Chart 8-39: Comparison Number Rated Versus Non-Rated Line Officers Selected for Below-Primary-Zone (Early) Promotion to Major (Bar Graph)**



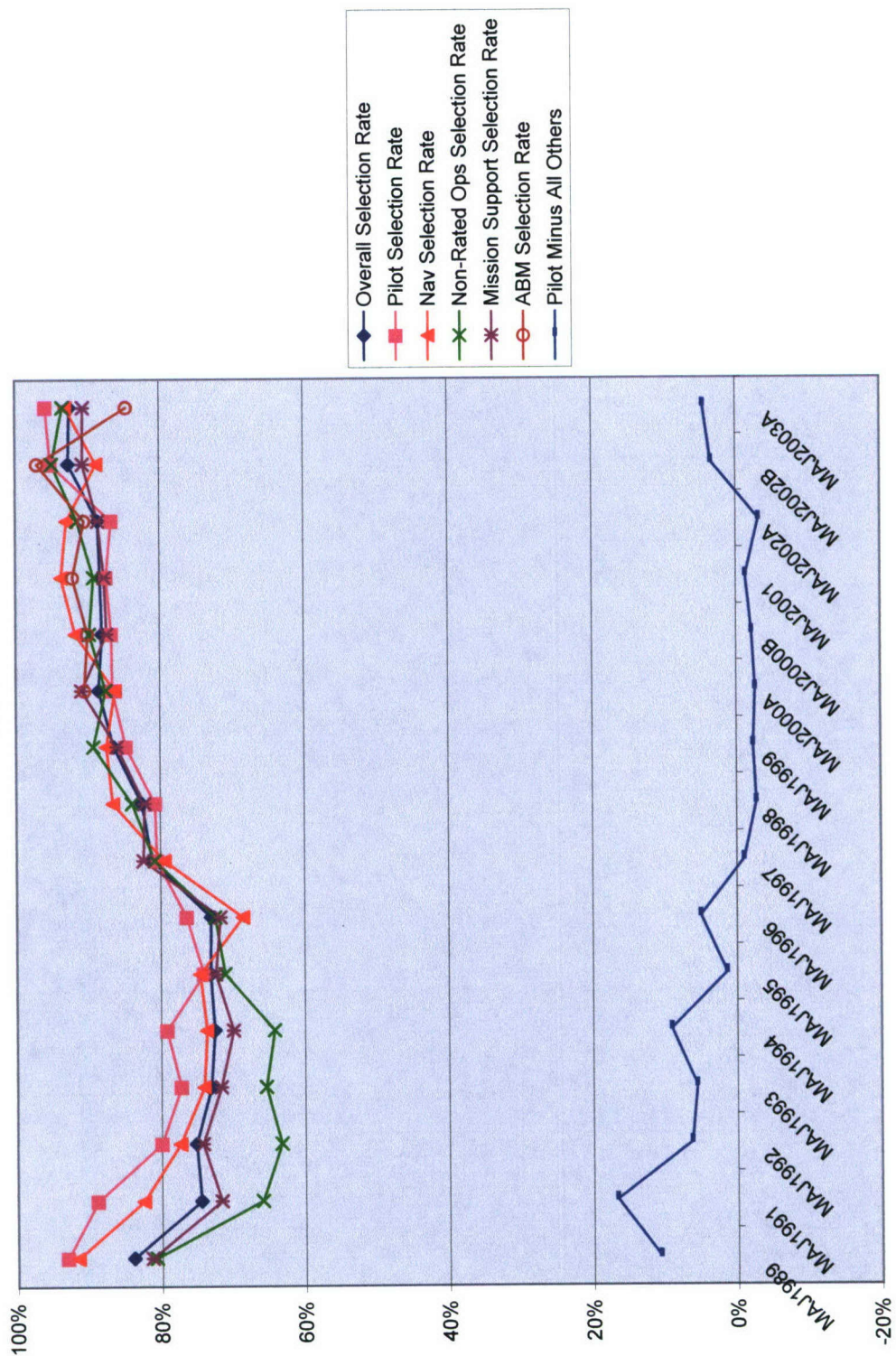
Data is discontinuous prior to 1989

track is roughly equal or moving in favor of the rated officers. If these officers do form an inner pool for selection to brigadier general, the 1976 and 1989 data points indicate that there would be future bumps of over proportional selection of non-rated officers.

In more recent times, the Air Force has provided data breakouts beyond the rated versus non-rated statistics. The data for the 1989-2003 promotion boards offered data on the line career categories of pilot, navigator, non-rated operations, mission support, and ABMs, which were part of the non-rated operations category until 2000. This lets us separate pilots from the other rated categories and eliminate any skewing caused by the navigators and ABMs on the rated numbers. Chart 8-40 (Line Major In-Primary-Zone (On-Time) Promotion Selection Rates by Category, 1989-2003) indicates, for example that navigator selection rates were pulling rated rates below pilot selection rates most of the time from 1989 through 1996 as well as in the 2002B and 2003A promotion boards. However, navigator selection rates actually equaled or exceeded pilot selection rates from 1997 through the 2002A promotion board. In fact, from 1997 through the 2002A board, the curves are tight together, with minimal dispersion; indicating very close selection rates for each officer category. This is what one would expect for in-primary-zone selection to major, where selection rates are high, and most officers have primarily worked in their job specialty. The 1989 through 1996, and 2002B and 2003A boards are marked by much more dispersion between career specialty curves as well as higher selection rates for pilots. In fact, comparing the differences in pilot versus all other line office selection rates for statistical significance



Chart 8-40: Line Major In-Primary-Zone (On-Time) Promotion Selection Rates by Category, 1989-2003



using differences of proportion shows that in-primary-zone selections for 1995 and 1997 through 2001 are statistically insignificant at a 2.5% rate. See Chart 8-41 (Comparison Line Major In-Primary-Zone (On-Time) and Below-Primary-Zone (Early) Differences of Proportion, 1989-2003). However, for the in-primary-zone promotions to major in 1989 through 1994, 1996, and the 2002B and 2003A boards, pilots are promoted at statistically significant rates above all other line officers. That is, if the boards consider all officers regardless of career field equally, and there is no skewing of “good” officers into any one field, one would only expect to get that big of a difference between pilots and all other officers 2.5% of the time or less. In the 2002A board, pilots were actually promoted at a statistically significant lower rate than all other line officers. The below-primary-zone promotion rates for pilots versus all other line officers are also mixed, with pilots being promoted to major at statistically significant rates above all other line officers except for the 1993 and 1995 promotion boards. The below-primary-zone difference of proportions appears to roughly parallel the in-primary-zone data through 1996. In 1997 and 1998, however, the below-primary-zone data is statistically significant in favor of pilots and climbing, whereas the in-primary-zone differences of proportions are statistically insignificant.

The lieutenant colonel data shows the wave of the 1989 and 1991 non-rated officers promoted to major being considered in the 1993, 1994 and 1996 lieutenant colonel promotion boards. See Chart 8-42 (Comparison Number of Rated Versus Non-Rated Line Officers Considered for In-Primary-Zone (On-Time) Promotion to



Chart 8-41: Comparison Line Major In-Primary-Zone (On-Time) and Below-Primary-Zone (Early) Differences of Proportion, 1989-2003

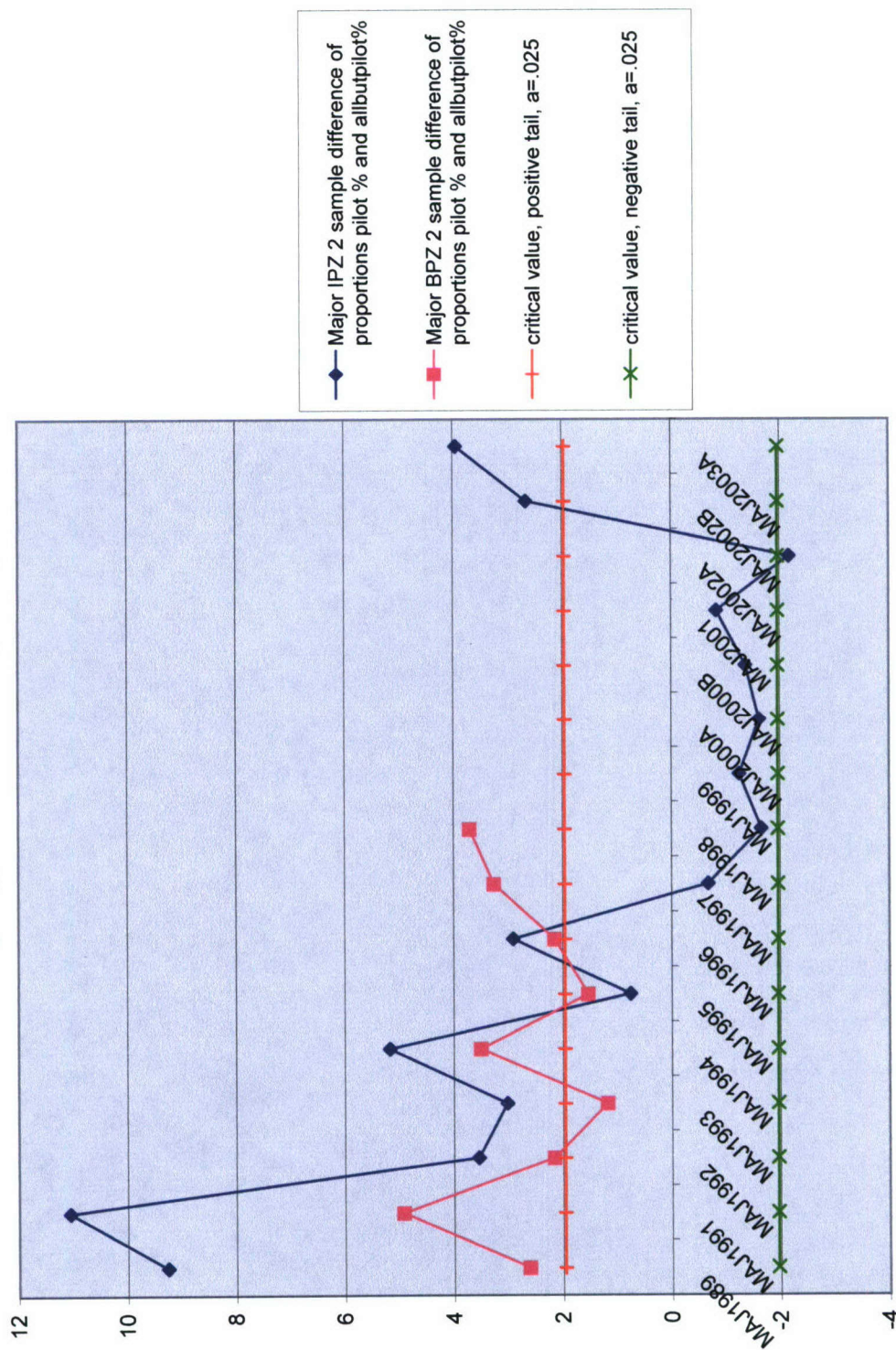
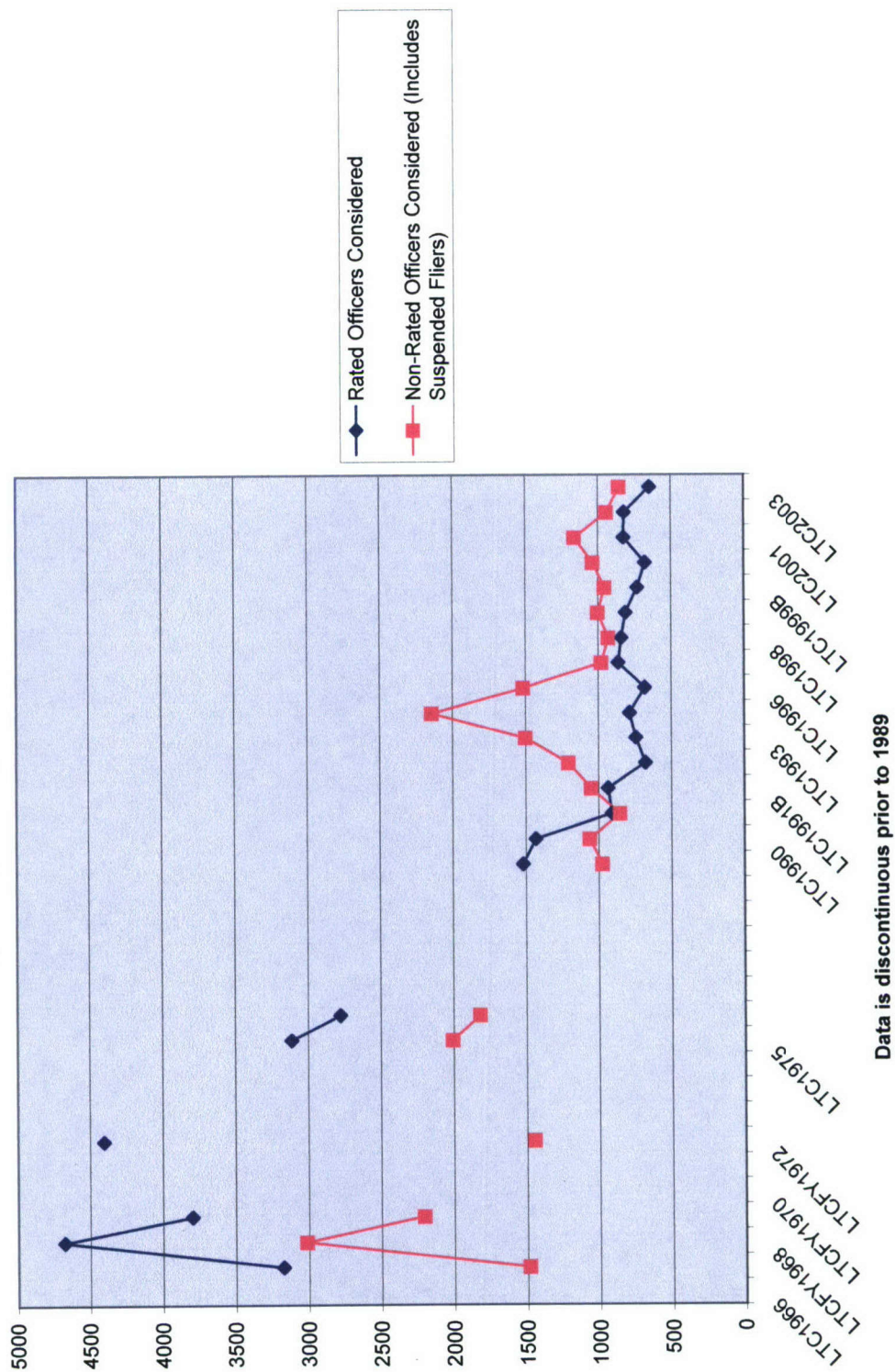


Chart 8-42: Comparison Number of Rated Versus Non-Rated Line Officers Considered for In-Primary-Zone (On-Time) Promotion to Lieutenant Colonel

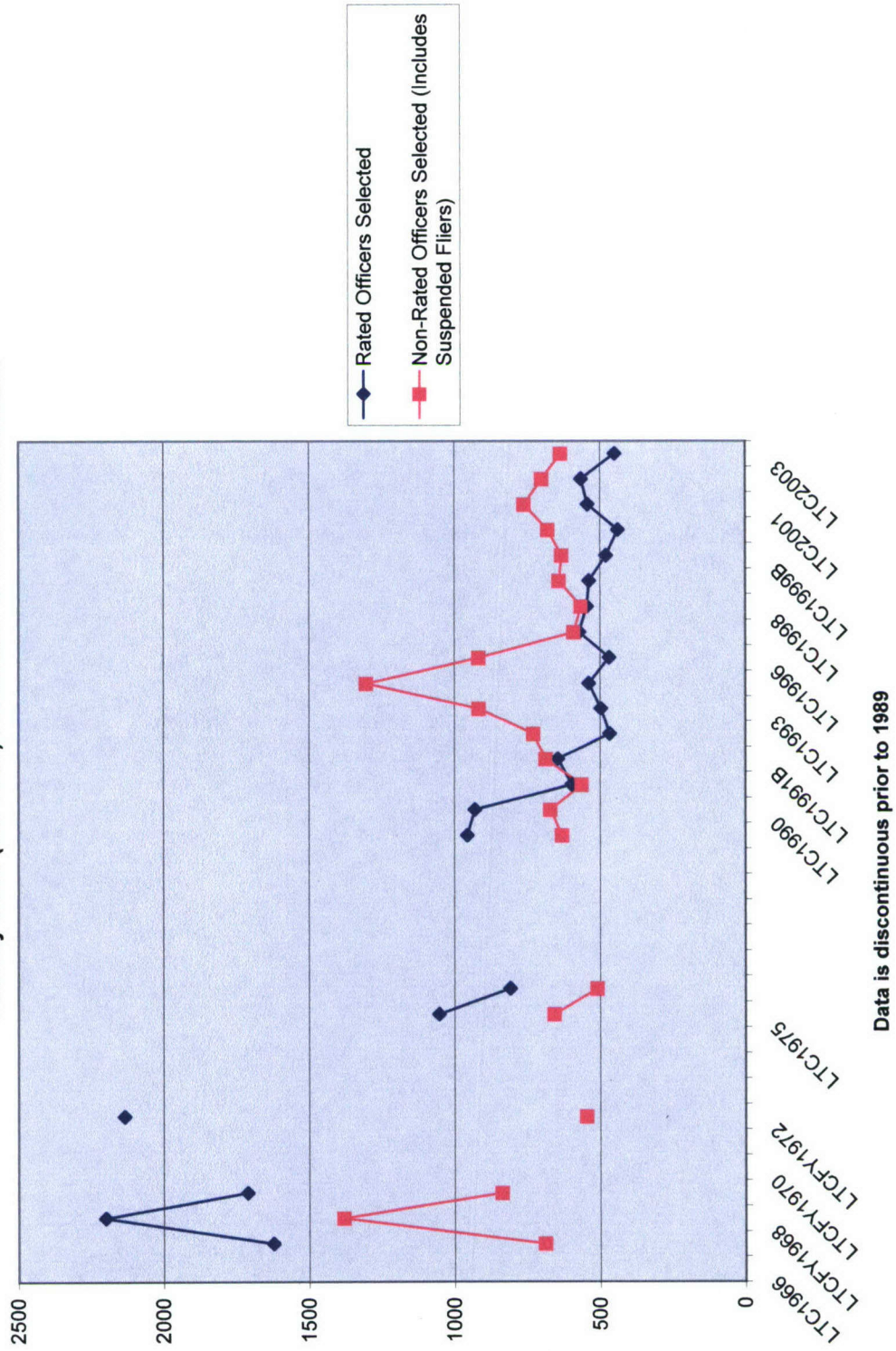




Lieutenant Colonel). Whereas the FY1975 major promotion board considered more non-rated than rated officers, this was not the case for lieutenant colonel promotions in the same period. At first glance, the data on in-primary-zone line lieutenant colonel selections appears to parallel the graphs of officers considered for promotion to lieutenant colonel. See Chart 8-43 (Comparison Number of Rated vs Non-Rated Line Officers Selected for In-Primary-Zone (On-Time) Promotion to Lieutenant Colonel). However, a look at selection rates in Chart 8-44 (Comparison of Selection Rates for Rated Versus Non-Rated Line Officers for In-Primary-Zone (On-Time) Promotion to Lieutenant Colonel) indicates variance between the selection rates, and a lower selection rate for non-rated officers in the early to mid 1990s when two or more non-rated officers were considered for each rated officer. That potentially indicates a conscious decision to trim some non-rated officers, although in 2002 and 2003 the non-rated officers were promoted at a higher rate again.

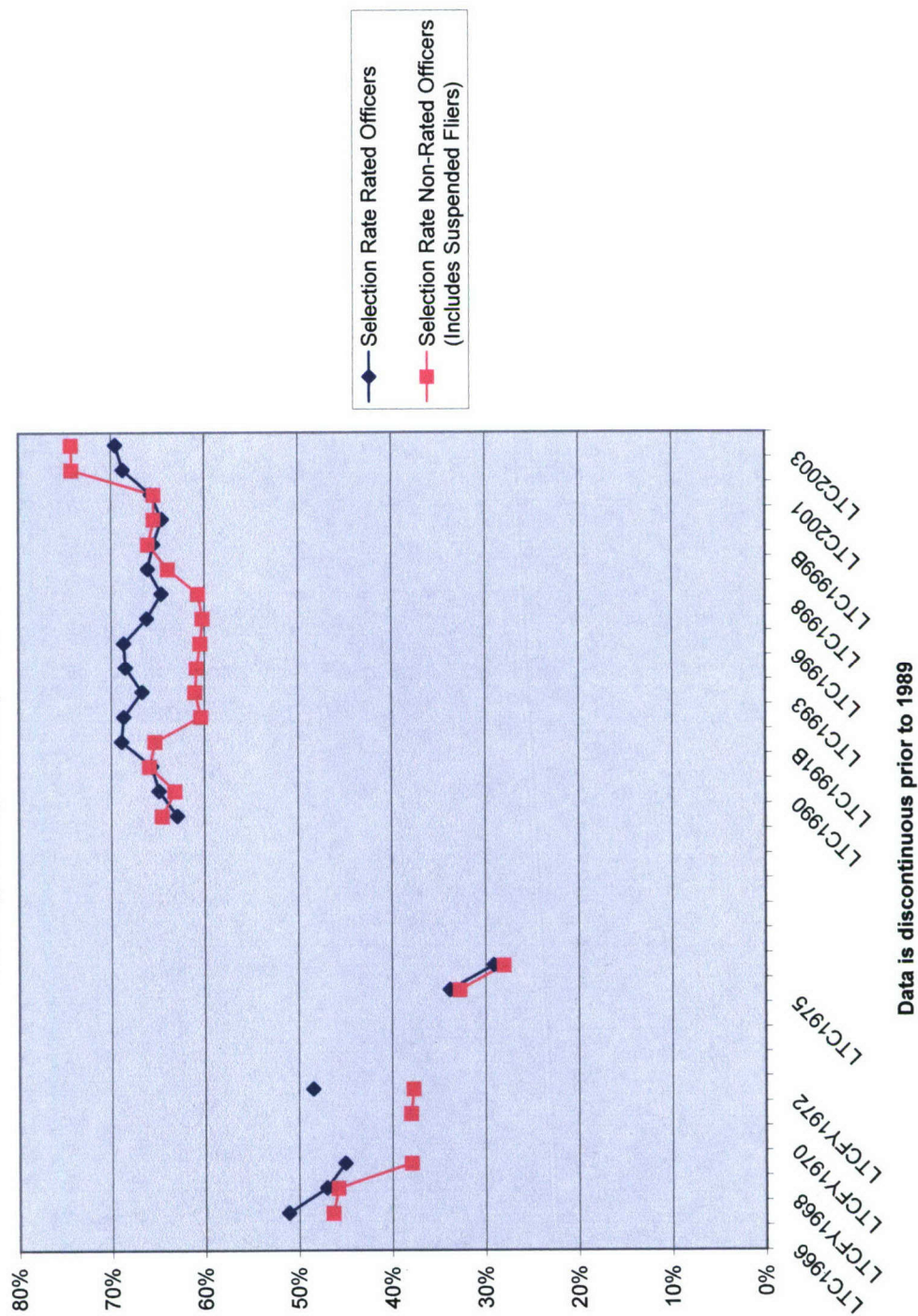
With respect to below-primary-zone promotions to line lieutenant colonel, the wave of non-rated officers is still evident, but it is shifted to the left somewhat as they are primarily considered for below-primary-zone promotion in the 1991A, 1991B, 1992, 1993, and 1994 boards. See Chart 8-45 (Comparison Number of Rated Versus Non-Rated Line Officers Considered for Below-Primary-Zone (Early) Promotion to Lieutenant Colonel). The number of non-rated officers considered for below-primary-zone promotion exceeds rated officers from 1990 through 2003, and the numbers considered are close in 1976. Once again, although more non-rated officers pass the

Chart 8-43: Comparison Number of Rated Versus Non-Rated Line Officers Selected for In-Primary-Zone (On-Time) Promotion to Lieutenant Colonel

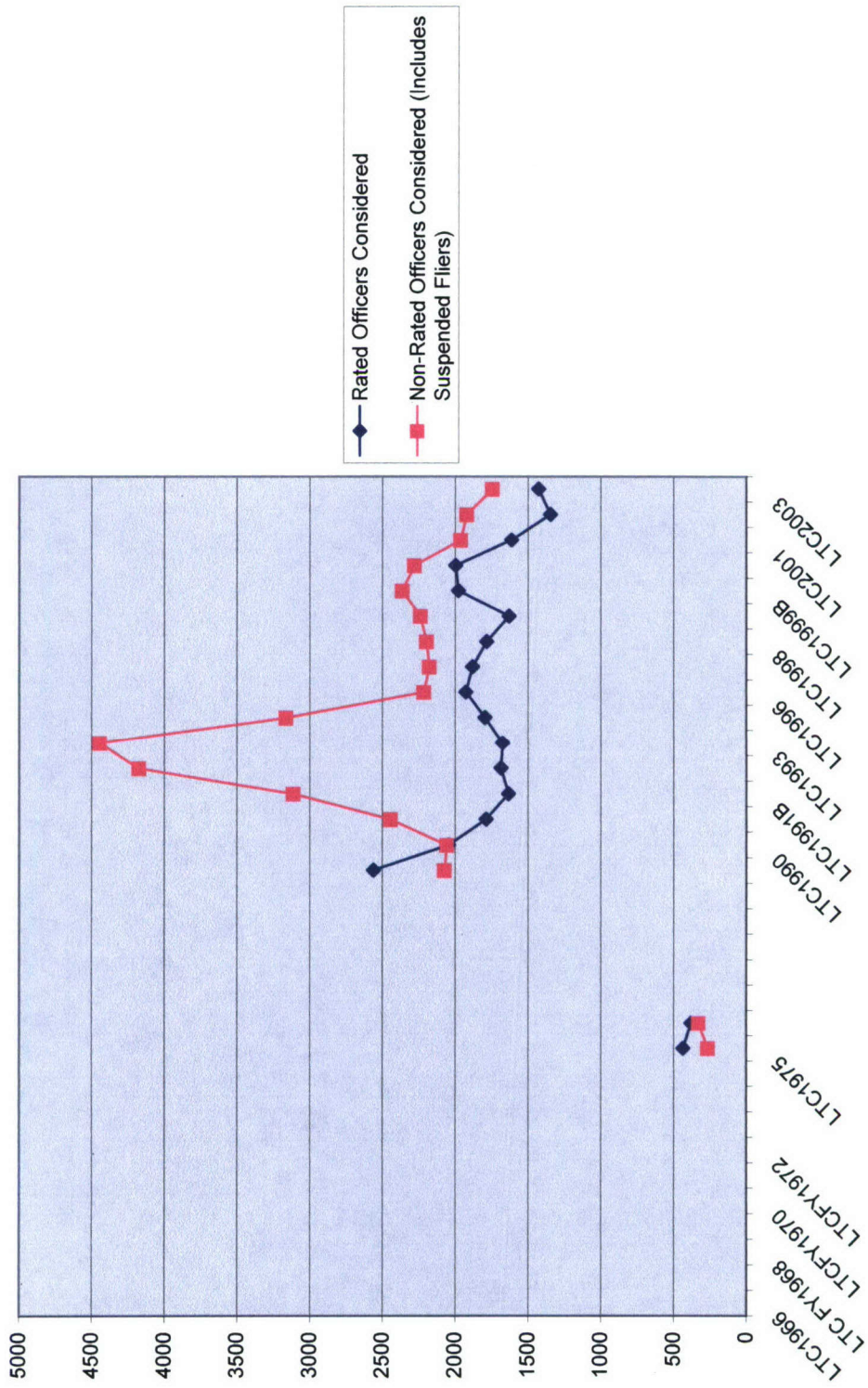




**Chart 8-44: Comparison of Selection Rates for Rated Versus Non-Rated Line Officers for In-Primary-Zone (On-Time) Promotion to Lieutenant Colonel**



**Chart 8-45: Comparison Number of Rated Versus Non-Rated Line Officers Considered for Below-Primary-Zone (Early) Promotion to Lieutenant Colonel**



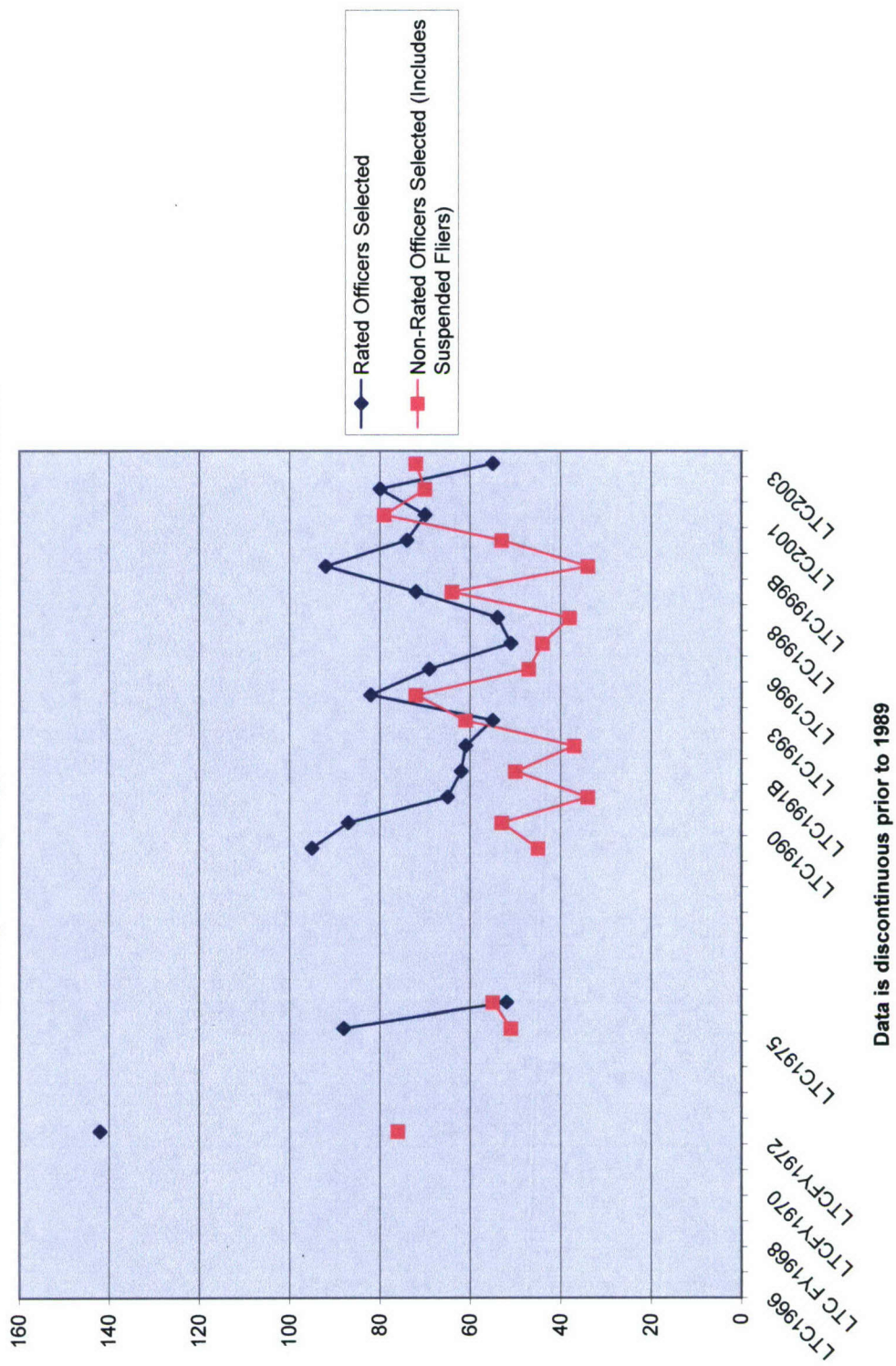
Data is discontinuous prior to 1989



major command screening boards and are forwarded to the promotion board for below-primary-zone consideration, more rated officers are typically selected. See Chart 8-46 (Comparison Number of Rated Versus Non-Rated Line Officers Selected for Below-Primary-Zone (Early) Promotion to Lieutenant Colonel). This results in generally lower selection rates for non-rated officers for below-primary-zone promotion to lieutenant colonel as shown in Chart 8-47 (Comparison of the Selection Rates for Rated Versus Non-Rated Line Officers for Below-Primary-Zone (Early) Promotion to Lieutenant Colonel).

With respect to the statistical significance of the differences between the rated and non-rated promotion rates for in-primary-zone and below-primary-zone promotions to lieutenant colonel, Chart 8-48 (Comparison Line Lt Col In-Primary-Zone (On-Time) and Below-Primary-Zone (Early) Differences of Proportion, Rated vs Non-Rated) shows a mixed bag for in-primary zone promotions. There was no statistical significance in the difference in promotion rates in 1968, although there statistically significant biases favoring rated selection in the promotion boards immediately before and after 1968. In the 1989 through 2003 data, there is a statistically significant bias favoring rated in-primary-zone promotions to lieutenant colonel from 1992 through 1997. The rest of the time, there is no statistically significant difference, except in 2002 and 2003 when a statistically significant bias favors non-rated officers. For the period of 1989 through 2003, there is a statistically significant difference favoring rated over non-rated officers for below-primary-zone promotion board except for 1997, 2001 and

**Chart 8-46: Comparison Number of Rated Versus Non-Rated Line Officers Selected for Below-Primary-Zone (Early) Promotion to Lieutenant Colonel**





**Chart 8-47: Comparison of the Selection Rates for Rated Versus Non-Rated Line Officers for Below-Primary-Zone (Early) Promotion to Lieutenant Colonel**

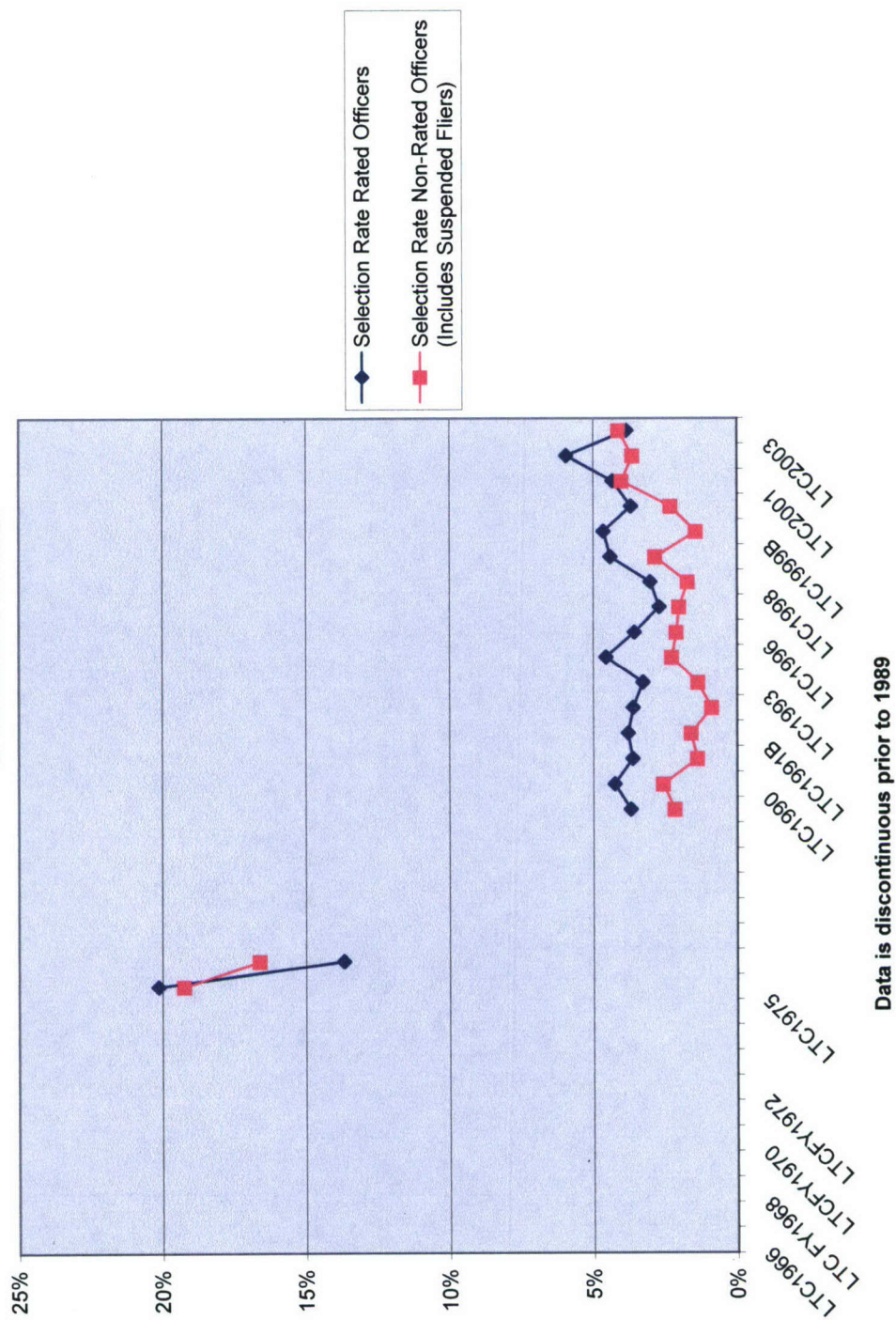
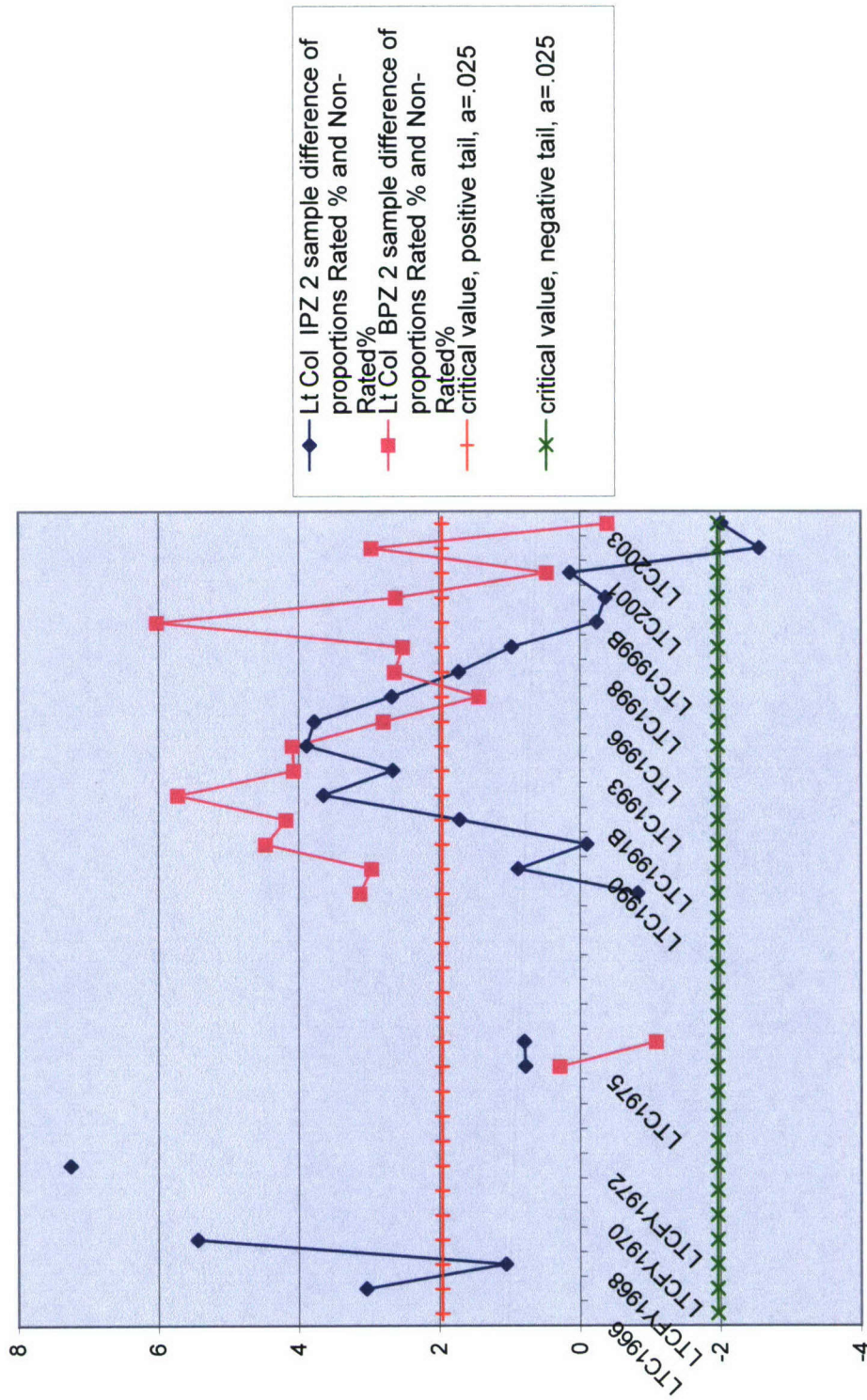


Chart 8-48: Comparison Line Lt Col In-Primary-Zone (On-Time) and Below-Primary-Zone (Early) Differences of Proportion, Rated vs Non-Rated



Data is discontinuous prior to 1989  
Discontinuous Data Until 1989

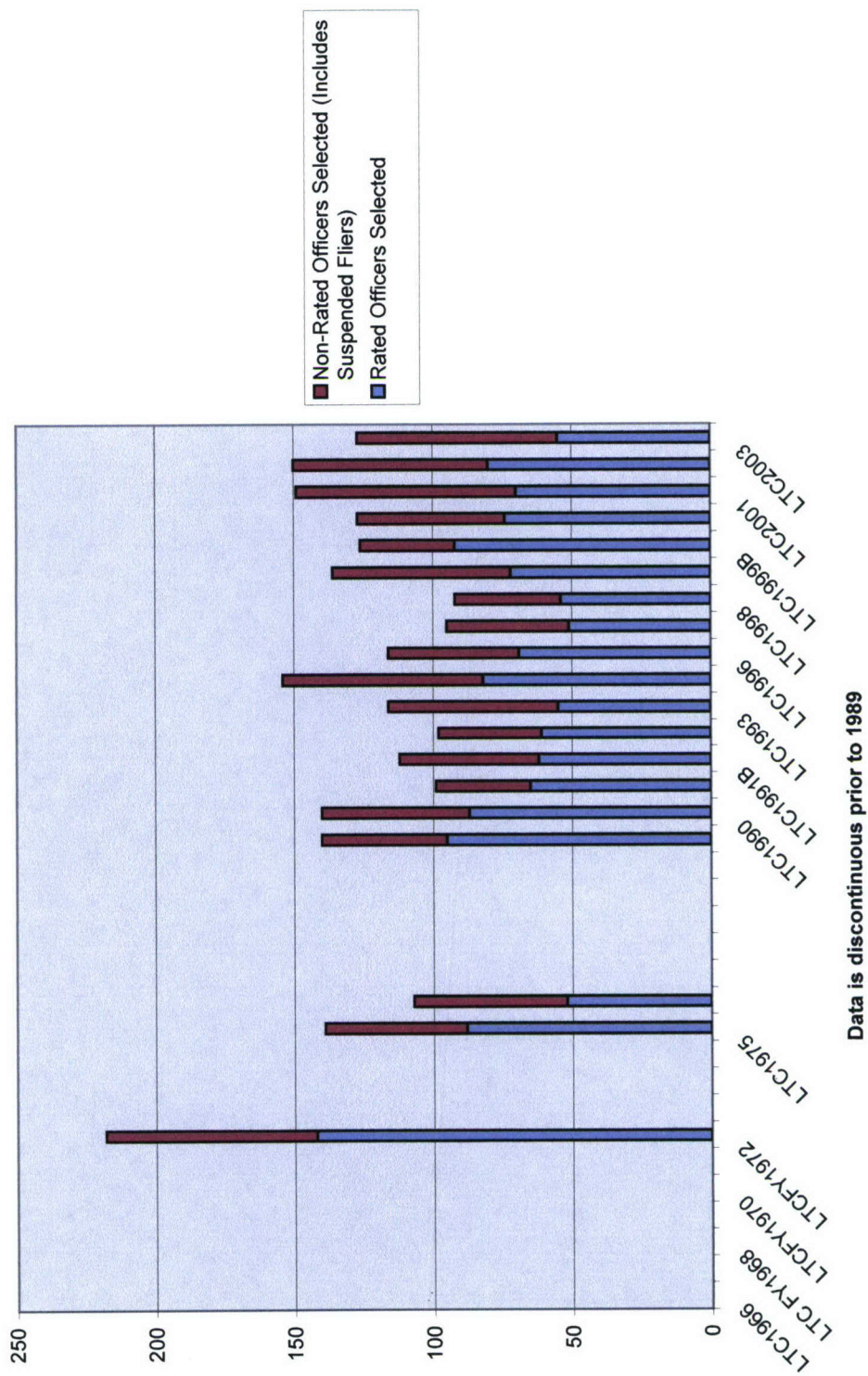


2003, when there is no statistically significant difference. In terms of actual fast-track officers, Chart 8-49 (Comparison Number of Rated Versus Non-Rated Line Officers Selected for Below-Primary-Zone (Early) Promotion to Lieutenant Colonel (Bar Graph)) shows that non-rated officers outnumber rated officers only in 1976, 1993, 2001, and 2003. In all data sets, however, it is interesting to note that at least 50 rated officers were always selected into the fast-track pool.

The primary difference one would expect between the major and lieutenant colonel promotion data is that rated majors across the board being considered for lieutenant colonel have all had the chance to get out of the cockpit and serve in staffs or other non-flying positions. One would then expect rated officers in-primary-zone consideration for lieutenant colonel to begin to close any previous biases favoring non-rated officers that were created by virtue of the fact that non-rated officers do not meet duty gates and can move into command and staff positions earlier. Rated officers still have not had the opportunity for command, because the first real flying command level is that of a flying squadron, typically commanded by a lieutenant colonel. However, there is a general discounting of non-flying command, especially at ranks below lieutenant colonel; so one would expect a relatively equal playing field, with perhaps a slight bias towards non-rated officers.

The data generated in the rated versus non-rated comparison generally meets that expectation. However, a look at the 1989 through 2003 in-primary-zone line lieutenant colonel promotion data broken out in more detail indicates much more

**Chart 8-49: Comparison Number of Rated Versus Non-Rated Line Officers Selected for Below-Primary-Zone (Early) Promotion to Lieutenant Colonel (Bar Graph)**





variance between career specialties than the data for promotion to major over the same time period. See Chart 8-50 (Line Lieutenant Colonel In-Primary-Zone (On-Time) Promotion Selection Rates by Category 1989-2003). In addition, pilot selection rates are visibly higher than most other categories until 2001, and navigator selection rates are always lower than the overall selection rate until 2003. Furthermore, non-rated operations officers generally compete with navigators for the lowest selection rates, excepting of course ABMs, whose low numbers yield great variance in year to year selection rates. These graphs are not unexpected since navigators, non-rated operations officers, and ABMs are competing with pilots for the same non-flying, operationally oriented jobs. ABMs were further hampered by perpetual under-manning, which limited opportunities for non-flying staff jobs since flying and ground-based radar sites were manned first. Pilots were promoted to lieutenant colonel in-primary-zone at statistically significant higher rates than non-pilots from 1989 through the 1999A board. See Chart 8-51 (Comparison Line Lt Col In-Primary-Zone (On-Time) and Below-Primary-Zone (Early) Differences of Proportion, 1989-2003). From the 1999B board through 2002, pilots and non-pilots were promoted at unbiased rates, and in 2003, non-pilots were actually promoted at a statistically significant higher rate than pilots. With respect to below-primary-zone promotion rates to lieutenant colonel, pilots were promoted at a statistically significant higher rate than non-pilots from 1989 through 2002, and in 2003, there was no bias between the pilot and non-pilot below-primary-zone selection rates.

Chart 8-50: Line Lieutenant Colonel In-Primary-Zone (On-Time) Promotion Selection Rates by Category 1989-2003

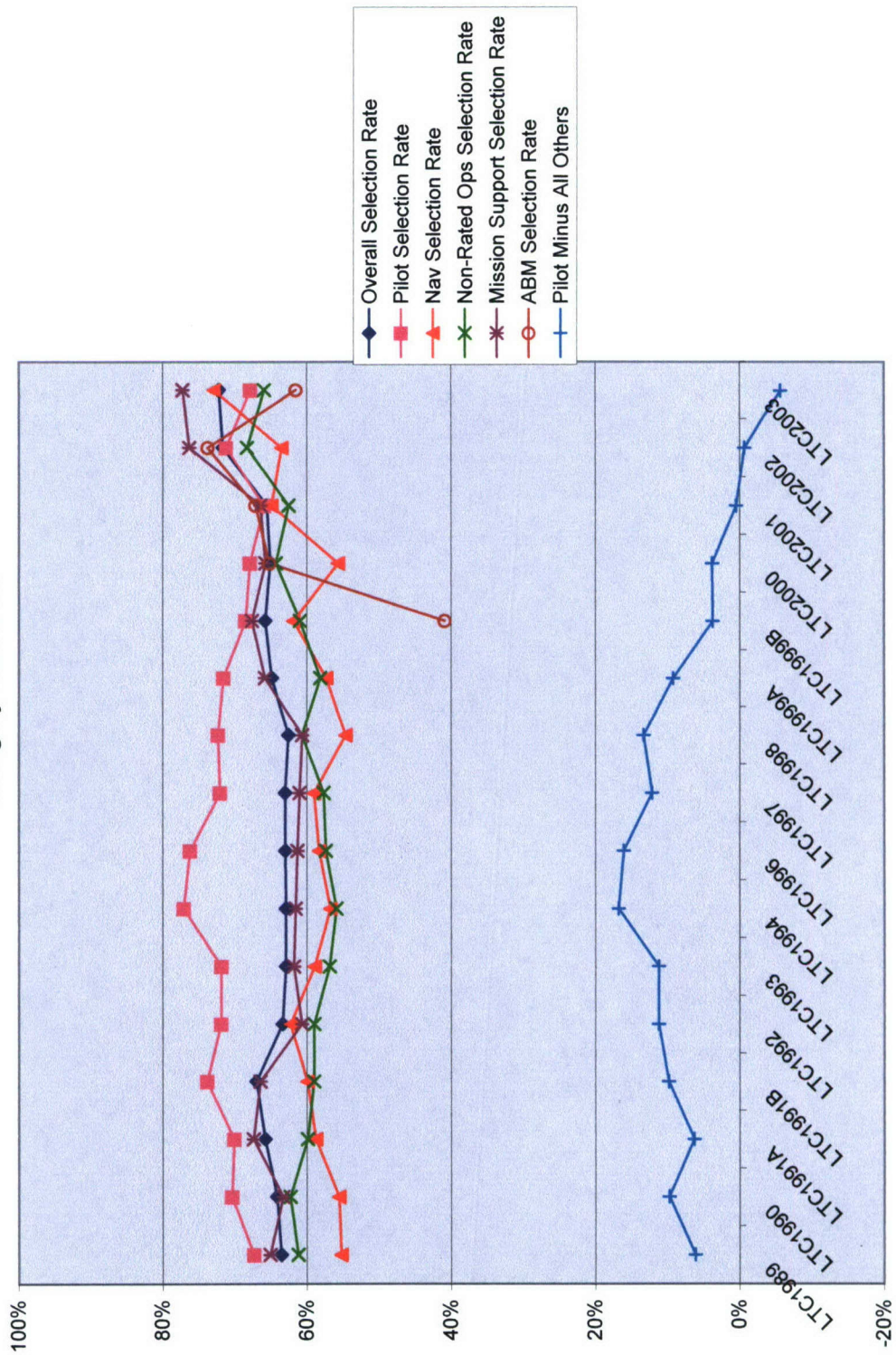




Chart 8-51: Comparison Line Lt Col In-Primary-Zone (On-Time) and Below-Primary-Zone  
(Early) Differences of Proportions, 1989-2003

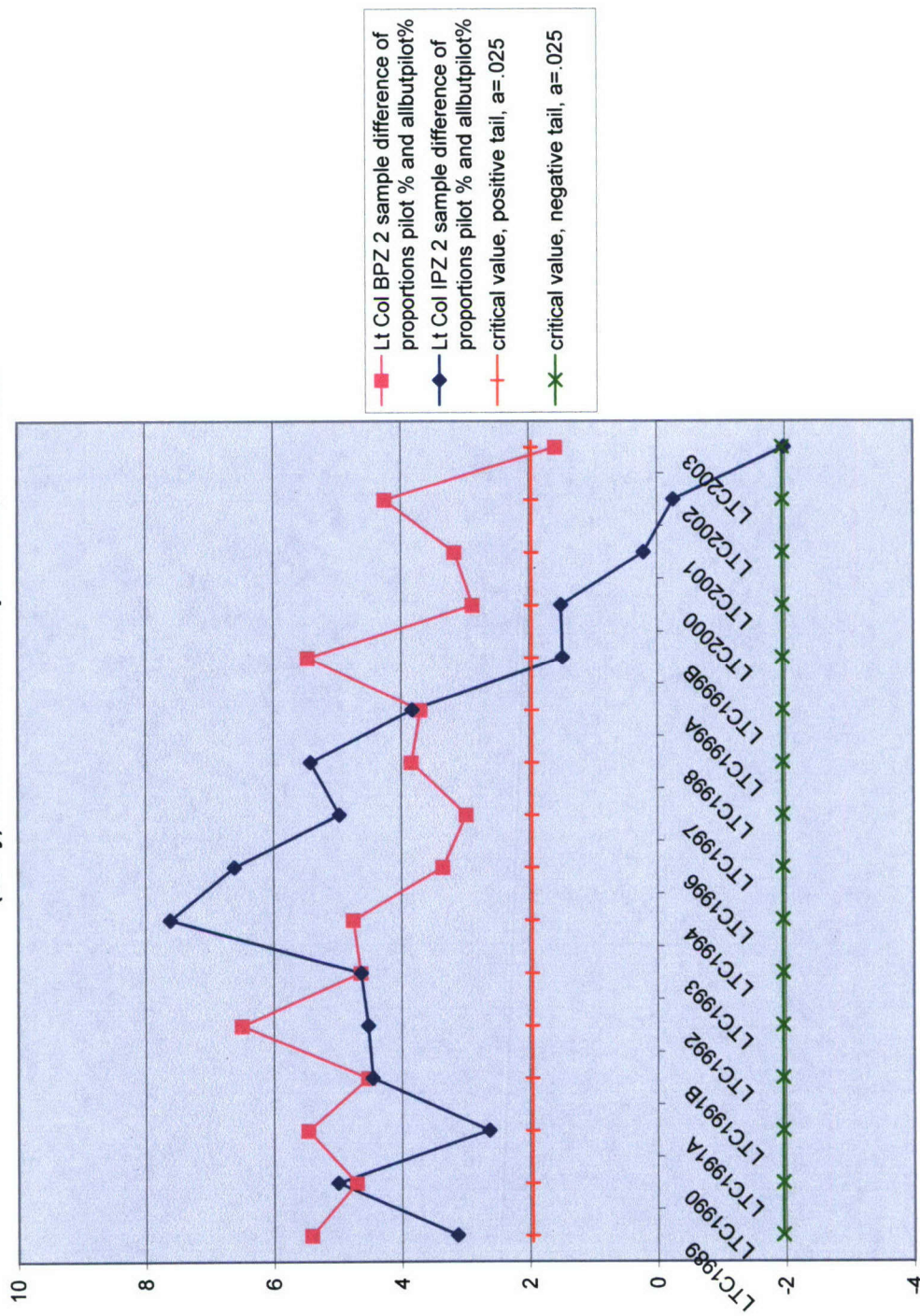
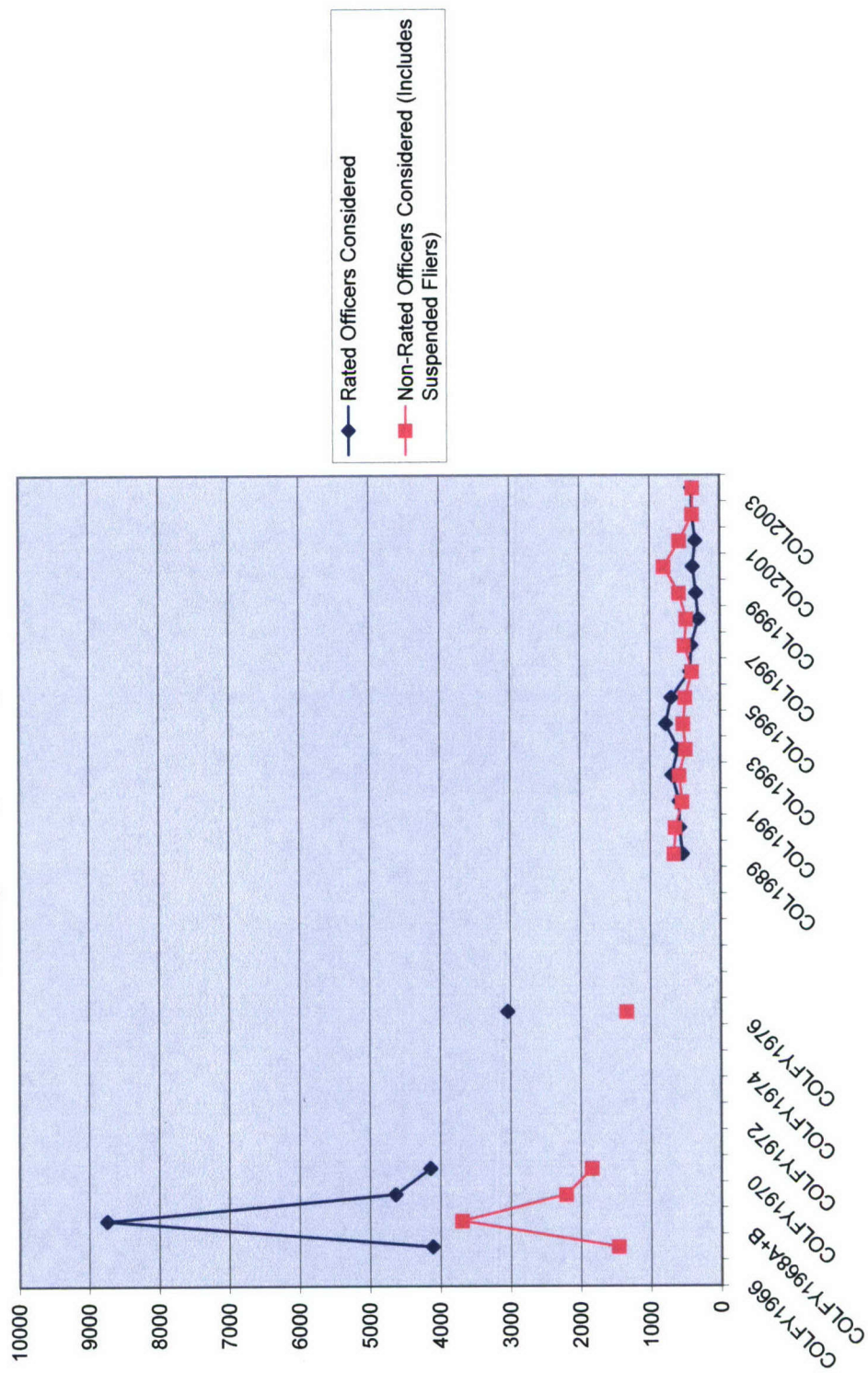


Chart 8-52 (Comparison Number of Rated Versus Non-Rated Line Officers Considered for In-Primary-Zone (On-Time) Promotion to Colonel) barely shows the wave of non-rated officers first seen in the 1989 and 1991 in-primary-zone major promotion boards as well as in the 1993, 1994 and 1996 lieutenant colonel in-primary-zone promotion boards, appearing in the 1999, 2000 and 2001 colonel in-primary-zone promotion boards. Chart 8-53 (Comparison Number of Rated Versus Non-Rated Line Officers Selected for In-Primary-Zone (On-Time) Promotion to Colonel) shows the non-rated wave more clearly. Selection rates, see Chart 8-54 (Comparison of Selection Rates for Rated versus Non-Rated Line Officers for In-Primary-Zone (On-Time) Promotion to Colonel), are mixed, with rated officers generally doing better in the 1960s and mid 1970s discontinuous data, but rated and non-rated officers each having equal or higher selection rates about half the time. Chart 8-55 (Comparison Number of Rated Versus Non-Rated Line Officers Considered for Below-Primary-Zone (Early) Promotion to Colonel) shows the non-rated officer wave slightly earlier as is usual for consideration for below-primary-zone promotion to colonel. The wave is evident in 1997, 1998, 1999, and 2000. However, as with the major and lieutenant colonel below-primary-zone selections, the larger number of non-rated officers making it through major command screening boards to the promotion board does not result in more non-rated officers actually being selected below-primary-zone during these years. See Chart 8-56 (Comparison Number of Rated Versus Non-Rated Line Officers Selected for Below-Primary-Zone (Early) Promotion to Colonel). The selection rate charts reflect

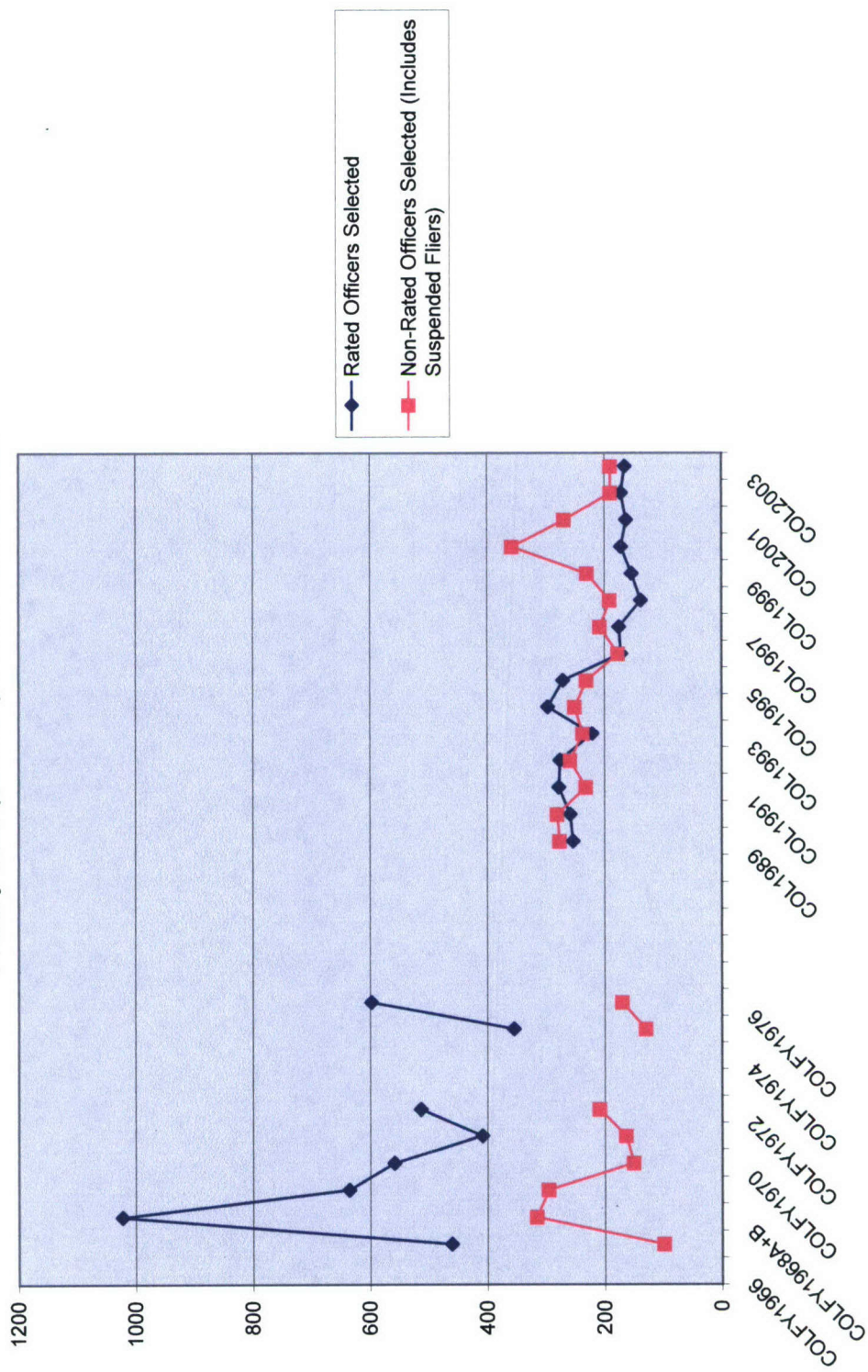


Chart 8-52: Comparison Number of Rated Versus Non-Rated Line Officers Considered for In-Primary-Zone (On-Time) Promotion to Colonel



Data is discontinuous prior to 1989

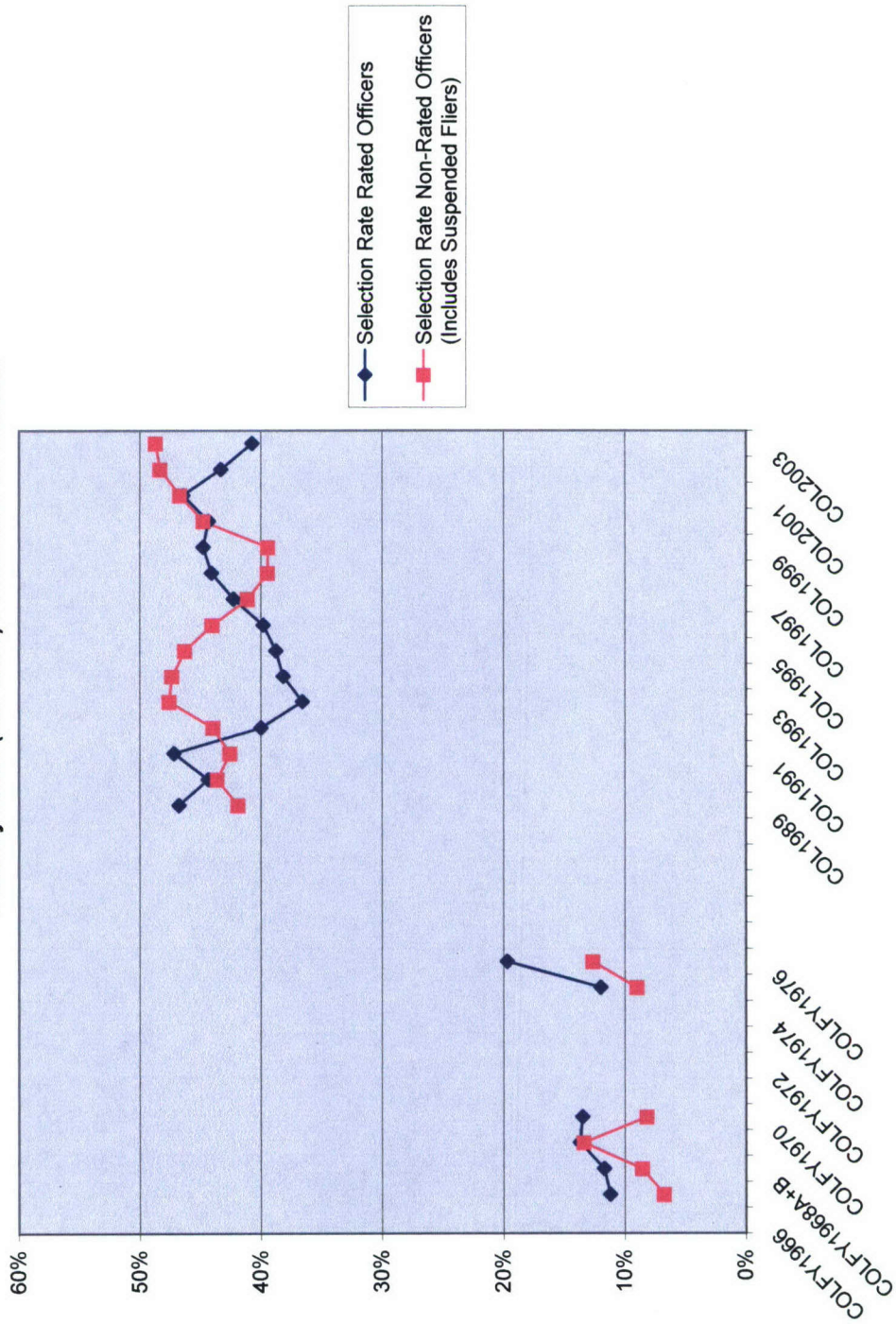
**Chart 8-53: Comparison Number of Rated Versus Non-Rated Line Officers Selected for In-Primary-Zone (On-Time) Promotion to Colonel**



Data is discontinuous prior to 1989



**Chart 8-54: Comparison of Selection Rates for Rated Versus Non-Rated Line Officers for In-Primary-Zone (On-Time) Promotion to Colonel**



Data is discontinuous prior to 1989

**Chart 8-55: Comparison Number of Rated Versus Non-Rated Line Officers Considered For Below-Primary-Zone (Early) Promotion to Colonel**

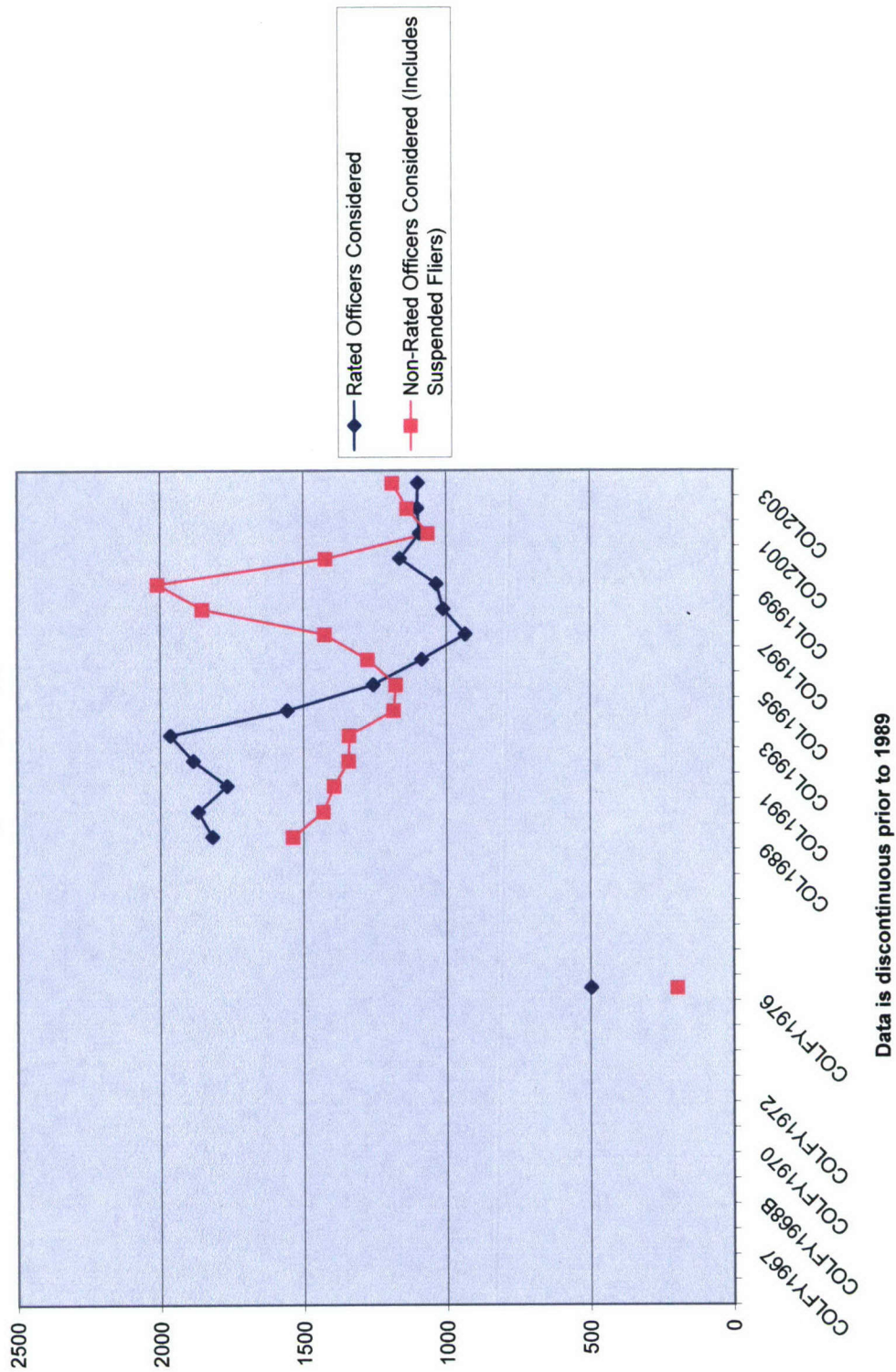
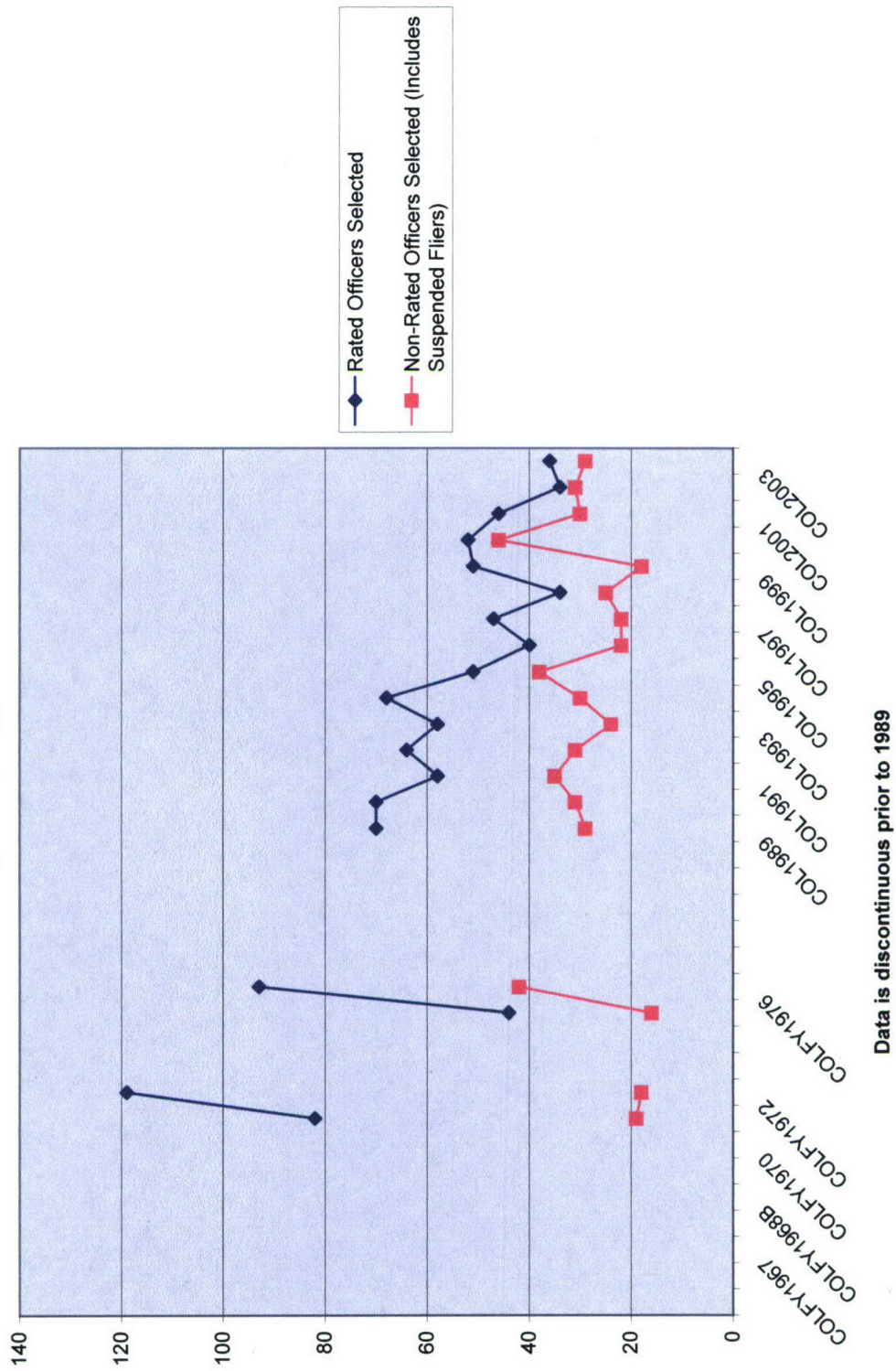




Chart 8-56: Comparison Number of Rated Versus Non-Rated Line Officers Selected for Below-Primary-Zone (Early) Promotion to Colonel

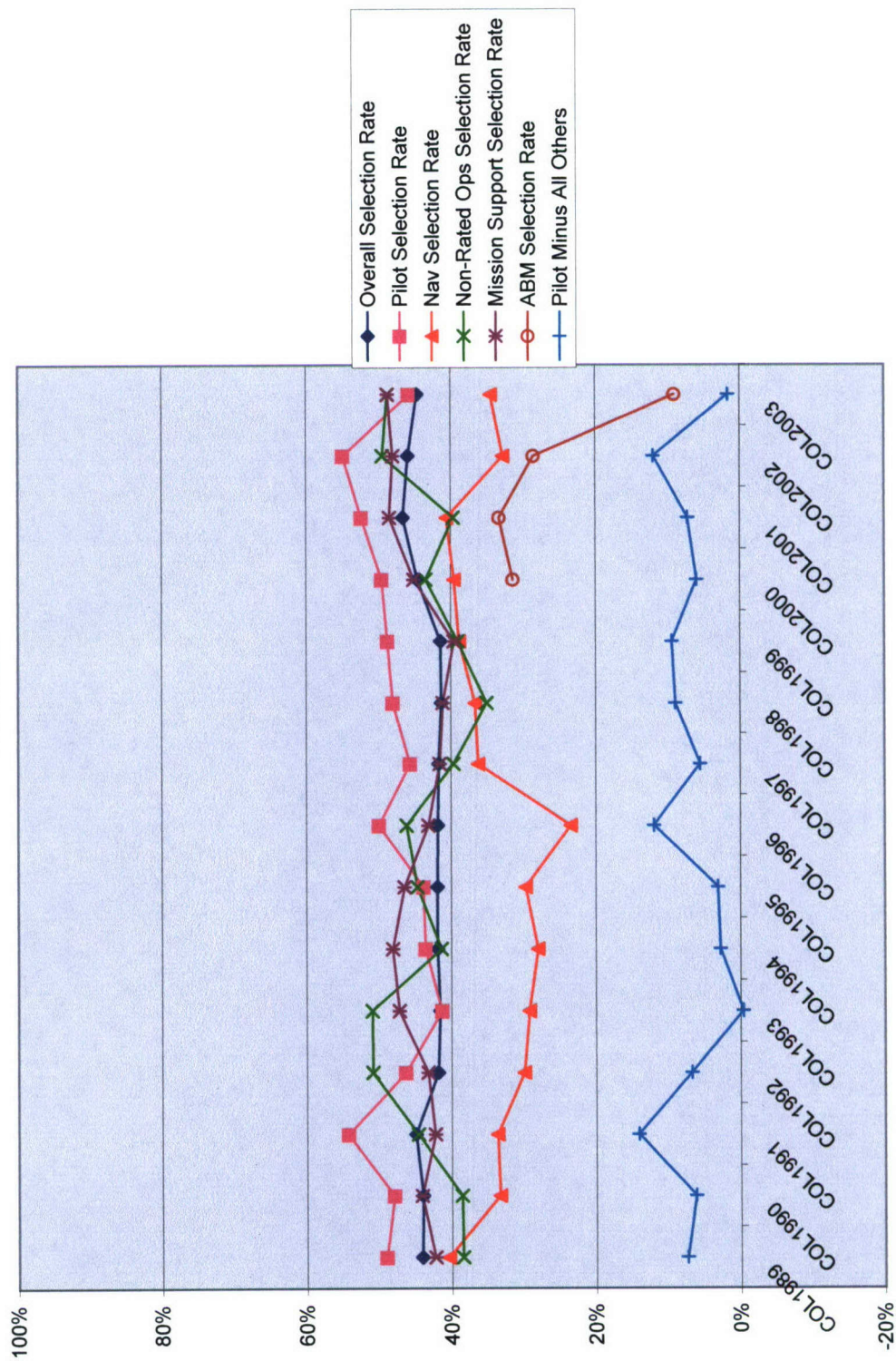


this fact, with non-rated officers always having a lower selection rate for below-primary-zone promotion to colonel from 1989 through 2003. However, the selection rates for in-primary-zone selection to colonel in FY1969, and 1989-2003 are not biased in favor of rated officers. In fact, they frequently favor non-rated officers at a statistically significant rate as in 1993, 1994, 1995 and 2003. Below-primary-zone promotions, however favor rated officers at a statistically significant level approximately half the time between 1989 and 2003, with there being no statistically significant difference in the below-primary-zone rates the rest of the time.

By the time rated officers are considered for colonel, they have finally had the opportunity to serve as flying squadron commanders, which is generally seen as trumping all other squadron level commands, regardless of how small operational flying squadrons are in terms of people in comparison to maintenance or security police squadrons, for example. Consequently, one would expect systemic biases favoring pilots for command of flying units and for future senior leadership positions, to be clear at the promotion to colonel point. Furthermore, if the below-primary-zone selectees for colonel provide the final assessment of the special pool of officers with higher than normal promotion chances to brigadier general, one would expect a clear bias in the favor of pilots for below-primary-zone selections to colonel. Chart 8-57 (Line Colonel In-Primary-Zone (On-Time) Promotion Selection Rates by Category, 1989-2003) shows a large variance between the selection rate curves for the various career specialty categories. Navigators fare poorly again, and ABMS have horrendous promotion rates,



Chart 8-57: Line Colonel In-Primary-Zone (On-Time) Promotion Selection Rates by Category, 1989-2003



although the number of ABMs considered is low. Pilots generally have the best selection rates, though not always. In terms of statistical significance, the in-primary-zone promotion rates show a statistically significant bias in favor of pilots just over half the time, with no bias towards pilots or all other line officers in the rest of the cases. See Chart 8-58 (Comparison Line Colonel In-Primary-Zone (On-Time) and Below-Primary-Zone (Early) Differences of Proportion, 1989-2003). Below-primary-zone promotion rates, however, show a clear statistically significant bias in favor of pilots for each promotion board between 1989 and 2003.

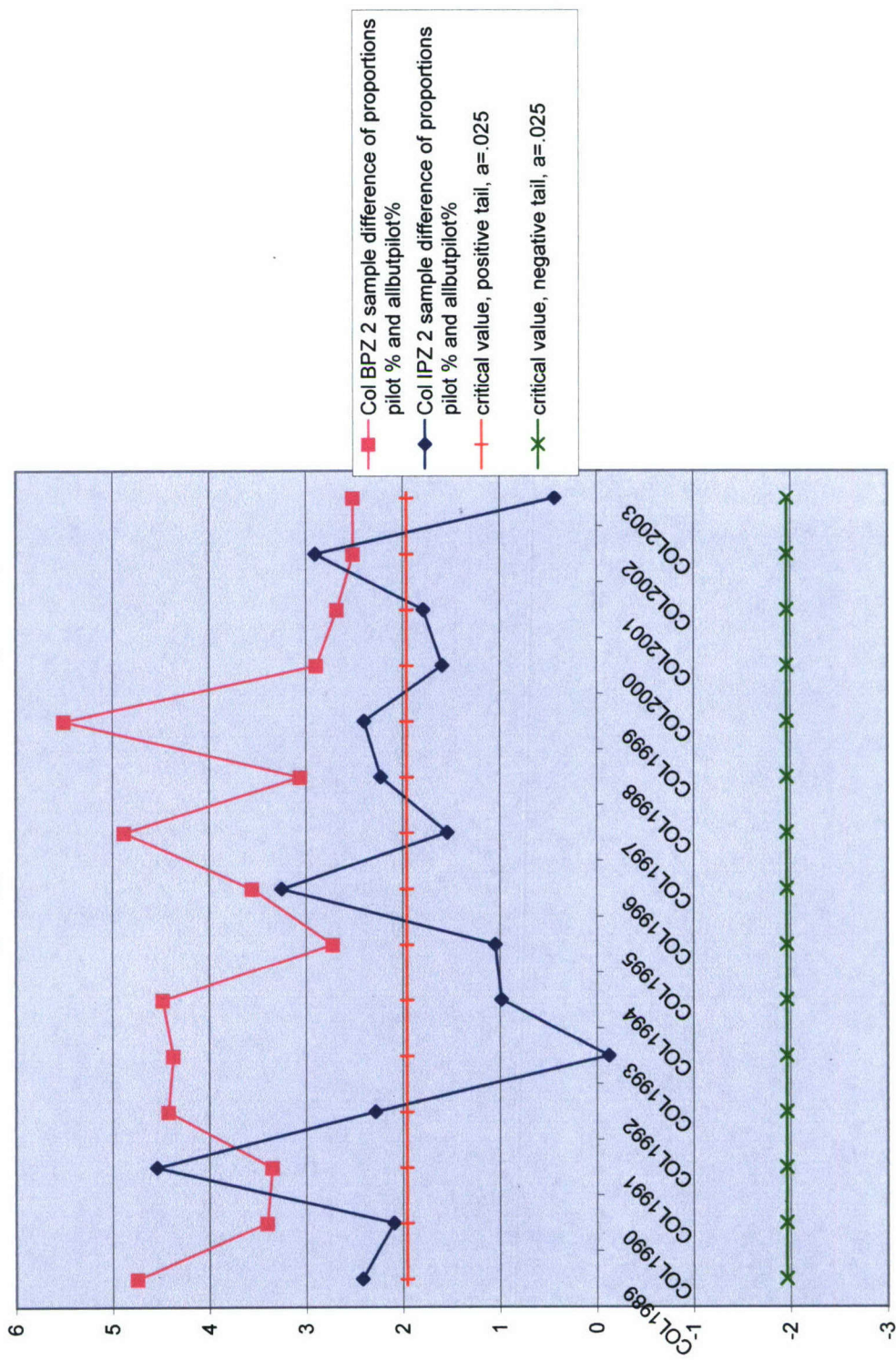
Chart 8-59 (Percent Line Officers Selected for Promotion to Major, Lt Col, and Colonel are Rated, In-Primary-Zone) graphically depicts (using discontinuous data) the percentage of officers selected in-primary-zone for major, lieutenant colonel and colonel that are rated. Chart 8-60 (Percent Line Officers Selected for Promotion to Major, Lt Col, and Colonel are Rated, In-Primary-Zone (With Trendlines)) is the same chart, but with polynomial trendlines added for each rank.<sup>290</sup> This big picture view shows the trendlines for the officers selected in-primary-zone to lieutenant colonel and colonel still in negative slopes, but starting to level at about 40% rated in 2003. The trendline for officers selected in-primary-zone to major is in a positive slope in the 1990s as it tries to capture the 1975 and 1989 data points which are much lower for major than for lieutenant colonel and colonel. The greater historical variation in

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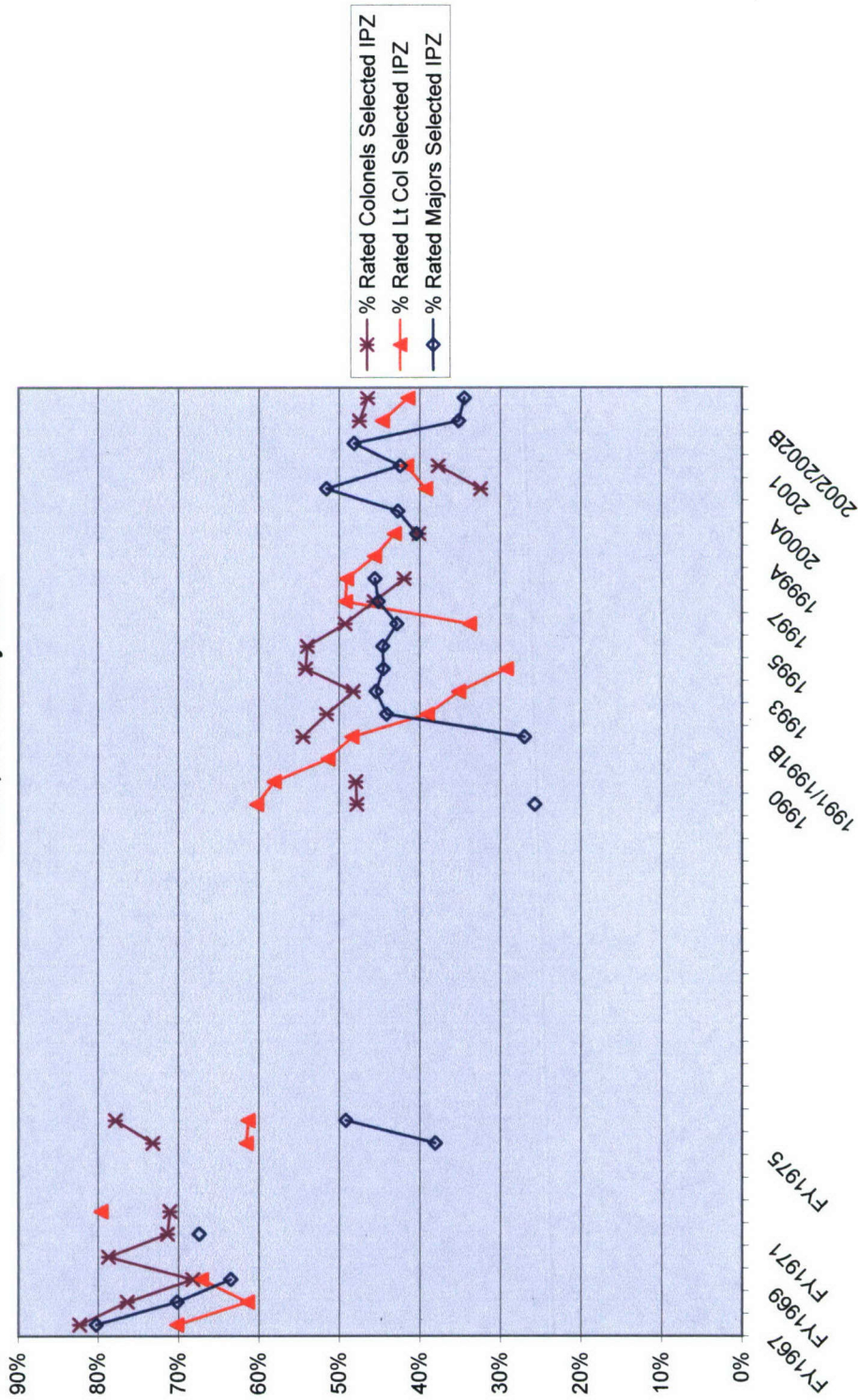
<sup>290</sup>  $R^2 = 0.8772$  for the colonel's line, 0.675 for the lieutenant colonel's line, and 0.6468 for the major's line.



Chart 8-58: Comparison Line Colonel In-Primary-Zone (On-Time) and Below-Primary-Zone (Early) Differences of Proportion, 1989-2003



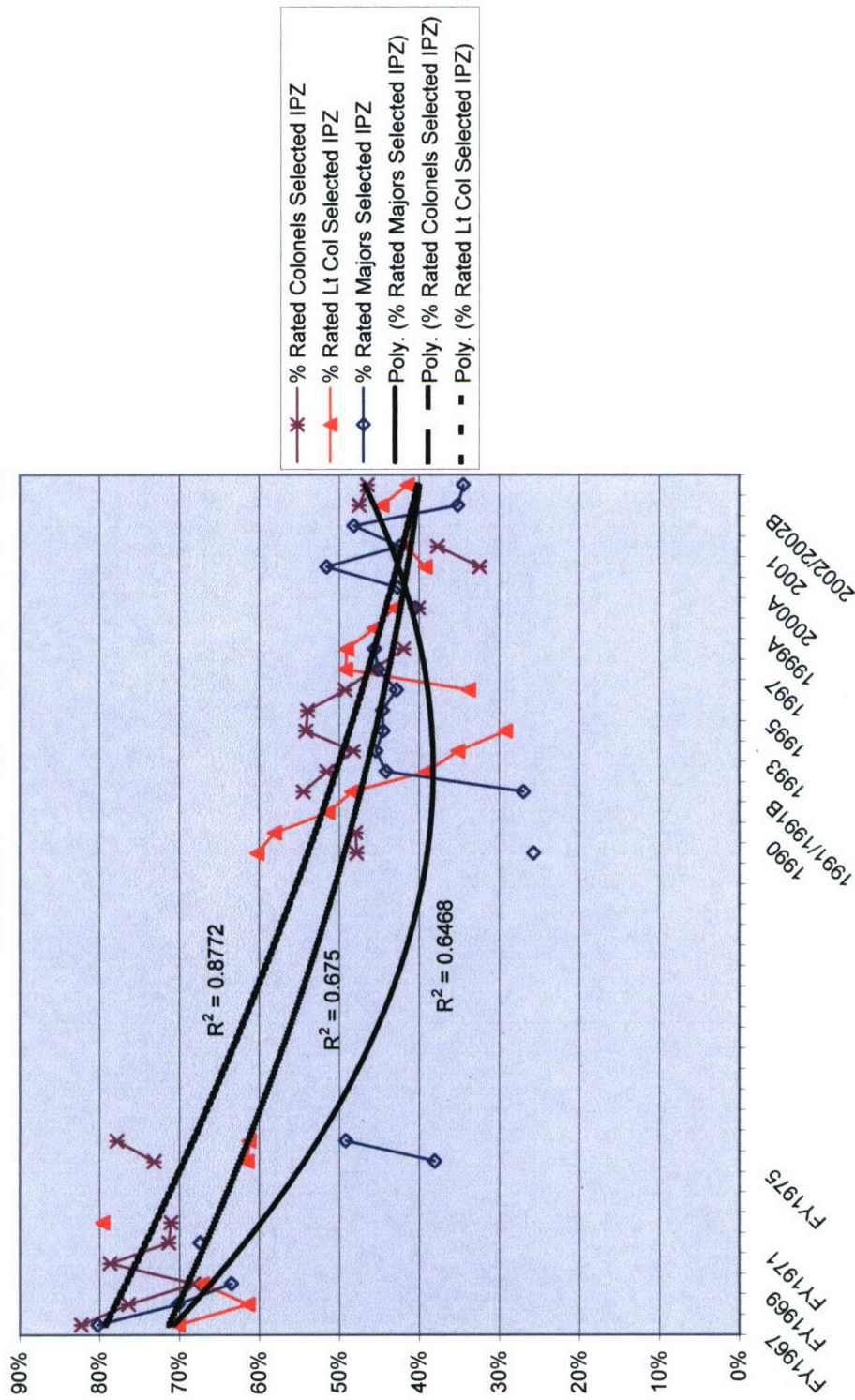
**Chart 8-59: Percent Line Officers Selected for Promotion to Major, Lt Col, and Colonel are Rated, In-Primary-Zone**



Promotion Boards FY1967-CY2003 (Some years have multiple boards, some none; discontinuous data prior to 1989)



Chart 8-60: Percent Line Officers Selected for Promotion to Major, Lt Col, and Colonel are Rated, In-Primary-Zone (With Trendlines)



Promotion Boards FY1967-CY2003 (Some years have multiple boards, some none; discontinuous data prior to 1989)

percentages of rated officers selected for major makes this curve less useful. In fact, plotting a trendline for just the 1989-2003 for in-primary-zone promotion to major flips the trendline over, giving it a decreasing slope at the end. In any event, the historic trend for all three ranks has been a decreasing percentage of rated officers, although each additional year's data would provide a clearer indication on when, or if, the individual rank trendlines will level out. If the trendlines for lieutenant colonel and colonel are reasonable approximations of reality, and are leveling out in the 40% rated range, then the wilder swings between rated and non-rated officers promoted to major are filtered out during promotions to the next two ranks. That would imply an amazing, self-balancing system since the Air Force maintains that there is no rated versus non-rated allocation at promotion boards, at least in the modern promotion system. In addition, it is somewhat suspicious that the percentages of non-rated officers selected for major, lieutenant colonel and colonel are all converging around 60%, when the percentage of non-rated lieutenants is roughly 85%, the percentage of non-rated captains is approximately 70% and the percentage of non-rated general officers is roughly 33% in FY2003. The difference in initial service commitments may play a role in cutting some of the non-rated officer preponderance in junior ranks since non-rated officers can leave the profession as young captains, and rated officers must serve longer and therefore are approaching promotion to major when they can leave. There is not a similar explanation, however, for the gap between the percentages of non-rated officers



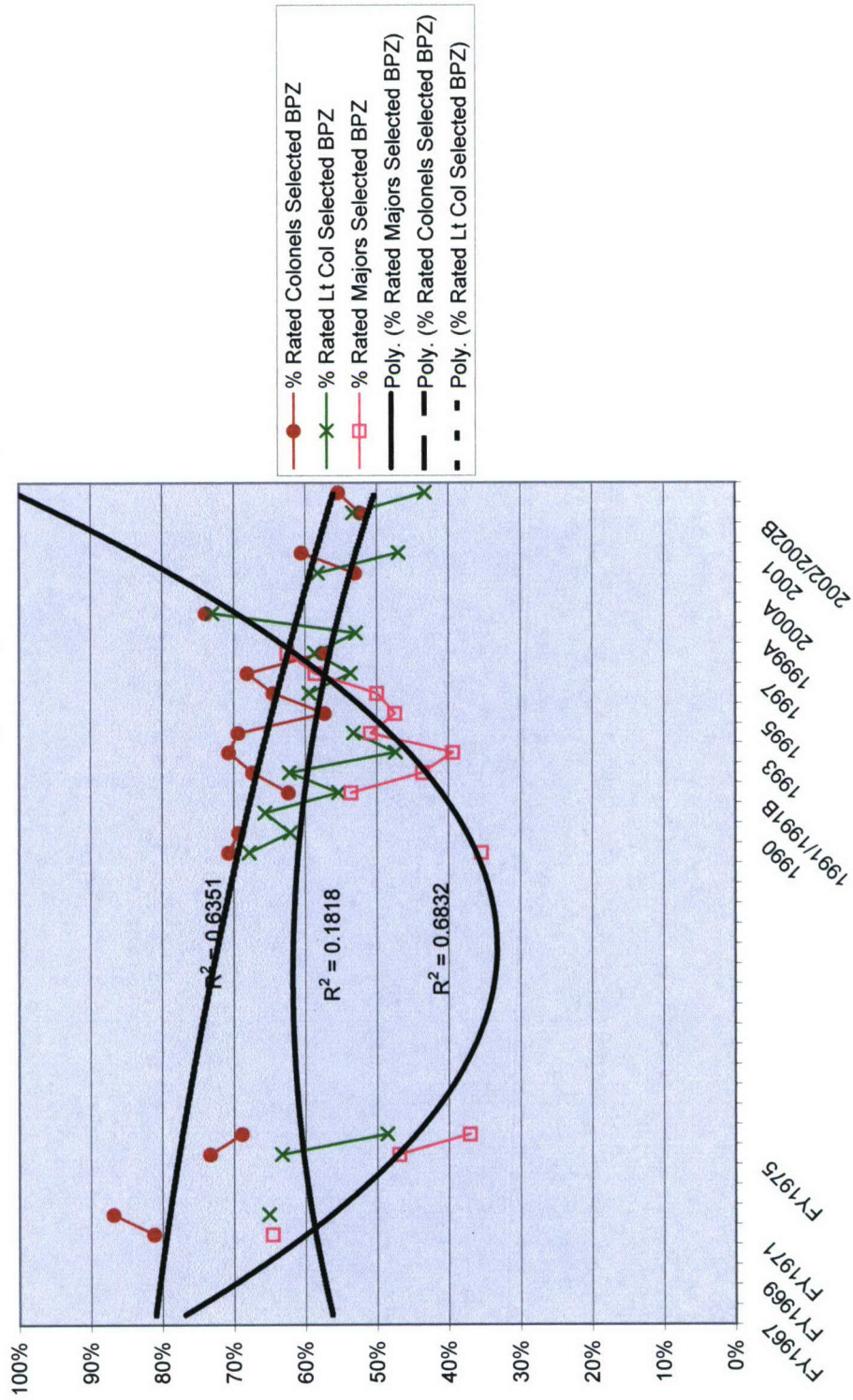
selected for in-primary-zone promotion to colonel and non-rated officers serving as general officers.

Below-primary-zone promotion selection statistics for promotion to major, lieutenant colonel and colonel provide a better explanation of how roughly 60% of the promotion selections for major, lieutenant colonel and colonel are non-rated officers, but only about 33% of general officers are non-rated. Chart 8-61 (Percent Line Officers Selected for Promotion to Major, Lt Col, and Colonel are Rated, Below-Primary-Zone (With Trendlines)) graphically depicts (using discontinuous data) the percentage of officers selected below-primary-zone for major, lieutenant colonel and colonel that are rated, with polynomial trendlines added for each rank.<sup>291</sup> This shows the trendlines for the officers selected below-primary-zone to lieutenant colonel and colonel in negative slopes in the late 1990s and early 2000s. As with the in-primary-zone graphs, the trendline for officers selected below-primary-zone to major is in a positive slope in the 1990s as it tries to capture the 1976 and 1989 data points which are much lower for major than for lieutenant colonel and colonel. Once again, the greater historical variation in percentages of rated officers selected for major makes this curve less useful. However, in the below-primary-zone case, plotting trendline for just the 1989-2003 below-primary-zone promotions corroborates the trends seen in the more historical

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<sup>291</sup>  $R^2 = 0.6351$  for the colonel's line, 0.1818 for the lieutenant colonel's line, and 0.6832 for the major's line.

**Chart 8-61: Percent Line Officers Selected for Promotion to Major, Lt Col, and Colonel are Rated, Below-Primary-Zone (With Trendlines)**



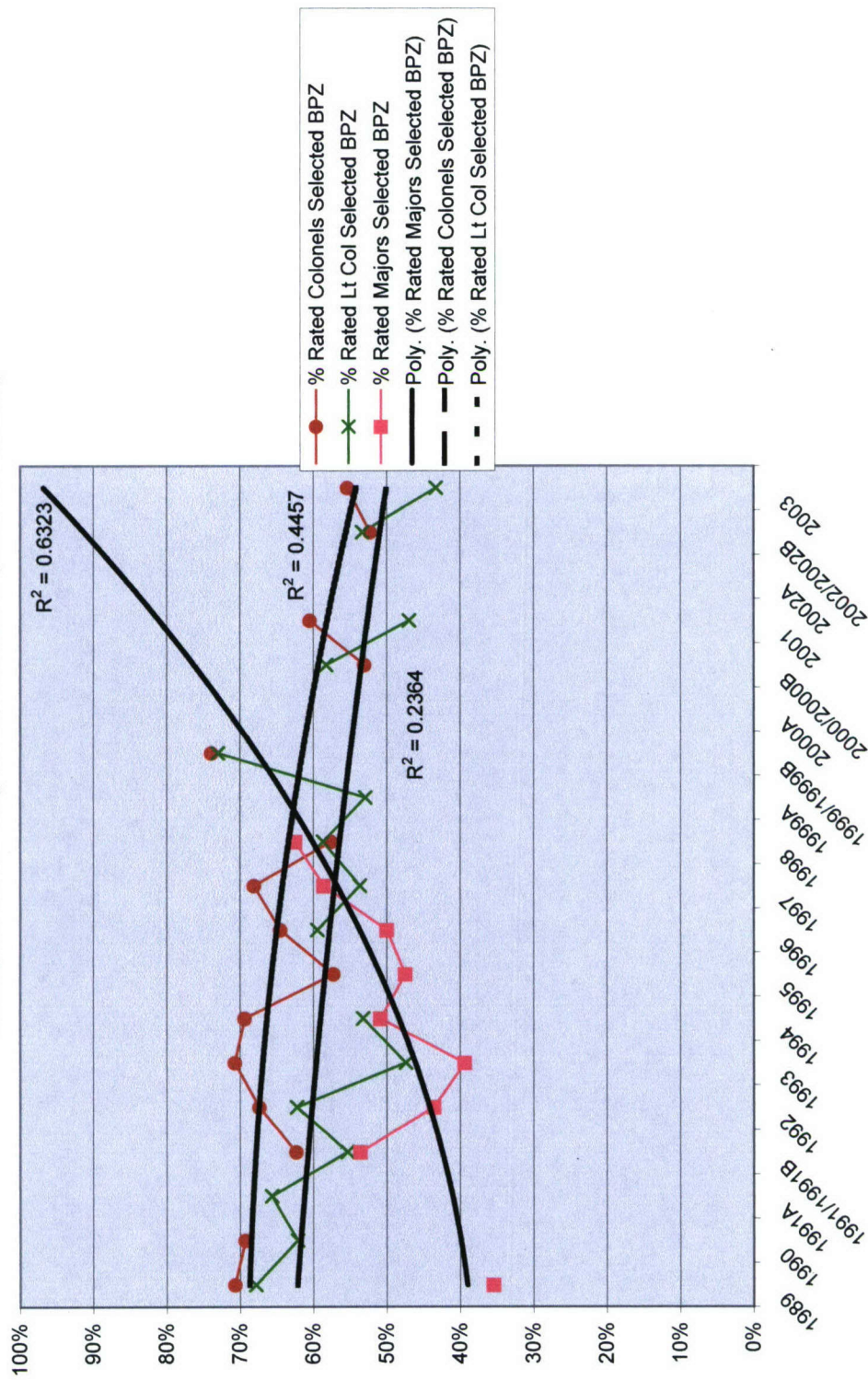
Promotion Boards FY1967-CY2003 (Some years have multiple boards, some none; discontinuous data prior to 1989)



view. See Chart 8-62 (Percent Line Officers Selected for Promotion to Major, Lt Col, and Colonel are Rated, Below-Primary-Zone, 1989-2003 (With Trendlines)).

From 1989 through 1998, the percentage of rated officers being promoted below-primary-zone to major was clearly moving in an upward direction, in spite of the prevailing trend towards increasing percentages of non-rated officers in the profession. In fact, some of the rated officers selected below-primary-zone for major in the 1998 promotion board conceivably were also part of the rated spike in the 1999B lieutenant colonel below-primary-zone promotions. This excess, however, appears to have been eliminated in the successive below-primary-zone promotions to colonel. The below-primary-zone trendlines for promotion to lieutenant colonel and colonel are much flatter in comparison to the in-primary-zone case. They are also at higher levels in 2003. The trendline for below-primary-zone colonels is at approximately 55% rated in 2003, but the in-primary-zone for colonels is roughly at 40% rated. The difference for lieutenant colonels is smaller, with the below-primary-zone figure approximately 50% rated versus roughly 40% rated for in-primary-zone selections. Consequently, the percentages of rated officers selected below-primary-zone for promotions to lieutenant colonel and colonel are not only higher than in-primary-zone, but also increase with rank. Consequently, one can visualize the stair-step distillation of increasing percentages of rated officers from below-primary-zone lieutenant colonel to colonel, and then the rated fast-burners continuing on to brigadier general.

**Chart 8-62: Percent Line Officers Selected for Promotion to Major, Lt Col, and Colonel are Rated, Below-Primary-Zone, 1989-2003 (With Trendlines)**



Promotion Boards 1989-2003 (Some years have multiple boards, some none)



The below-primary-zone promotion system allows the profession to fast-track a small number of officers into command billets and/or billets that broaden their perspectives, make them more promotable, and line them up for further billets of increasing responsibility. The system has a clear bias favoring pilots, not because the broadening jobs require pilot skills, as much as the broadening is being done to create the most highly qualified pool possible from which to select general officers. Pilots can broaden as majors, lieutenant colonels and colonels into other line positions, but non-rated officers cannot broaden into cockpits or leadership positions in flying units at that level—even though the law forbidding non-pilots command over flying units was repealed in 1974. Navigators and ABMs have difficulty beating out pilots for the flying positions and in practice, navigators and ABMs are restricted to units with aircraft that they are qualified in, whereas the profession has no compulsion in making a B-52 pilot with no previous experience the squadron commander of an AWACS squadron. Pilots are universally qualified within the profession, but other officers are not. Non-pilots cannot simply be given any general officer position. They are restricted to appropriate positions. This of course requires more detailed planning and limits personnel options. Consequently, there is a limit to how many non-pilot general officers could serve in the Air Force because non-pilots, and non-rated officers in particular, are inherently inflexible, and after all, flexibility is the key to airpower. The percentage of rated officers, who are predominantly pilots by this time, who are selected below-primary-zone for promotion to colonel, may be an indication on what that limit is believed to be

(55% in 2003). Or at least it is a safe zone, while the profession comes to grips with the growth of C4ISR officers and the decrease in pilots and navigators within its ranks, and the shifting locus of decision-making out of the cockpit and into the C4ISR system.

### Conclusion

This chapter concluded the discussion begun in Chapter 7 on structural factors within the Air Force and its officer corps that created or perpetuated the overrepresentation of pilots at the general officer level. This chapter began with the question of whether pilots need to be officers, and concluded that the officer corps of the independent Air Force evaded the question by simply making all pilots officers. The heavy reliance on the Aviation Cadet Program to provide rated officers cemented the correlation between piloting and officership since flying skill, not education or experience, was the sole criterion for officership. If piloting was the membership qualification for the inner core of the profession, it was only natural that pilots were overrepresented in the general officer ranks. In addition, the emphasis on flying has led to a more equitable distribution of general officers in terms of commissioning sources. Air Force Academy graduates have not achieved the dominance of general officer ranks that West Point graduates once did. In fact, the Air Force Academy seems to have perpetuated many of the heroic warrior perspectives one would have expected from graduates of the Aviation Cadet Program, instead of the visionary warrior perspectives one would have expected from service academy graduates. This chapter then moved on to the question of how many pilot officers does the Air Force officer corps actually



need. This turned out to be a difficult question to answer because the officer corps innately fears being caught without enough pilots. Although the data suggests a rough rule of thumb ratio of 3.5 pilots per aircraft, the officer corps does not advertise this figure, which is just as well since it does not represent pilot requirements as much as pilots on hand. This figure is affected by the officer corps' tradition of carrying an active duty pilot reserve cloaked in non-pilot billets. The extent of this force has been decreasing, but the flight pay and bonus systems appear designed to encourage pilots to remain in the officer corps long after their prime flying days to take senior billets that do not require flying skills. This also contributes to the overrepresentation of pilots in the general officer ranks. The third and final section of the chapter examined and found evidence of a promotion system bias in favor of pilots and rated officers at the field grade level. The bias at the general officer level was already apparent. At the field grade level, the bias is more pronounced in the below-primary-zone promotions, which is to be expected since this small, select group of officers tends to have more breadth and/or more command experience than their peers and are generally believed to be in the grooming process and inside track for the pool of potential brigadier generals. Consequently, the promotion system bias also contributes to the overrepresentation of pilots in the general officer ranks.

## **Chapter 9: Evolution of Potentially Visionary Perspectives Within the General Officer Corps**

### **Introduction**

Chapter 7 and Chapter 8 form a set that analyzes various factors that created or perpetuated the overrepresentation of pilots in the general officer ranks. The chapters explained why the overrepresentation persists in the face of dramatic changes in the way the Air Force officer corps fights, in the officer corps' expertise and jurisdiction, and in the composition of the officer corps. These issues were covered in Chapters 3-6. The profession's sense of social responsibility requires it to stay abreast or even lead-turn the changing nature and character of war, but there appears to be a gap in the logic of the argument. If the general officer ranks are over-proportionally pilot, that would seem to imply that the general officer ranks are over-proportionally heroic warrior. Yet the sense of social responsibility requires the general officers to be visionary warriors. The missing piece of the puzzle, the piece that bridges this gap, is the evolving characteristics of the line general officer corps, which leads the evolution of the total officer corps. That bridge is the focus of this chapter and the next.

This chapter examines the evolution of the line general officer corps across several variables that highlight the heroic versus visionary warrior debate. The data comes from samples, based on general officer biographic data. Details of the sample methodology are contained in Appendix A. This chapter primarily analyzes changes in characteristics of the line general officer corps as a group. However, it also provides



comparisons of pertinent differences in characteristics between the 4-star and the 1-3 star line general officers since the 4-star rank is truly the innermost core of the profession, setting the policies that affect the rest of the officer corps.<sup>292</sup> Brief descriptions of the variables follow.

The first variable to be examined is the evolution in the initial and in the apparent Air Force Specialty (Career Field) Codes of the line general officer samples. This variable captures the diversity of career fields being accepted into the inner corps of the profession as the percentage of non-rated general officers increased. It also provides data on the relative status of various career fields as measured by officers who have changed specialties during their careers. The second variable is loosely described as pilot skills as proxy variables for leadership and decision-making. This variable traces the shifting weight of emphasis given to things like total flying hours and combat sorties in the general officer biographies. In addition, it contains a more qualitative *hot stick* (great pilot) sub variable, measured by things like whether a general officer is an ace or a graduate of the Fighter Weapons School. These sub variables provide indications of how valued pilot skill was in a given sample.

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<sup>292</sup> The independent Air Force has a long-standing tradition of “Corona” conferences, in which all the actively serving 4-star generals periodically meet and discuss major issues affecting the profession. The 4-star general samples range from seven to ten generals per sample, and the 1-3 star samples range from 49 to over 70 per sample. Consequently, the 4-star sample sizes are susceptible to large fluctuations. However, the total population of 4-star general officers in the Air Force during any of the sample years never exceeds 14, and the 4-star samples always include more than 50% of the population. Part of the fluctuations are the result of fluctuations in the total population.

The next variable concerns what levels and what types of unit general officers have commanded. Although command has had less and less to do with combat as time goes on, it is nonetheless important because it appears to be a required statement in the biographies from the more recent samples. In addition, the decreasing trend of the percentage of officers whose first or only wing commands were over bomber and fighter units indicates a shift from the heroic to the more encompassing visionary warrior perspective. Professional military education is the next variable. Like the flying hours and command experience, a statement on professional military education appears to be a requirement in the more recent biographies. Attending intermediate and senior service schools is important because, unlike doctors, lawyers, and ministers, military officers receive much of their professional training midway through their careers. If large numbers of officers reach general officer rank without the professional military education, it would call the entire system into question. The career broadening variable examines whether general officers tend to be promoted as specialists, whether in rated or non-rated capacities, or generalists. The more generalist the upbringing, the more visionary the officers should be. The last variable examined in this chapter is referred to as exotic characteristics. It is made up of several sub variables, which match different types of exotic duty tours that general officers may have served. Exotic tours include, for example, exchanges with foreign militaries or other US services, serving as an aide, or in legislative liaison. As with career broadening, it provides an indication of the value the general officer corps places on such vision-expanding tours. In addition,



observable trends in sub categories like service as an aide or in legislative liaison could signal major changes in the understanding of profession within the general officer corps.

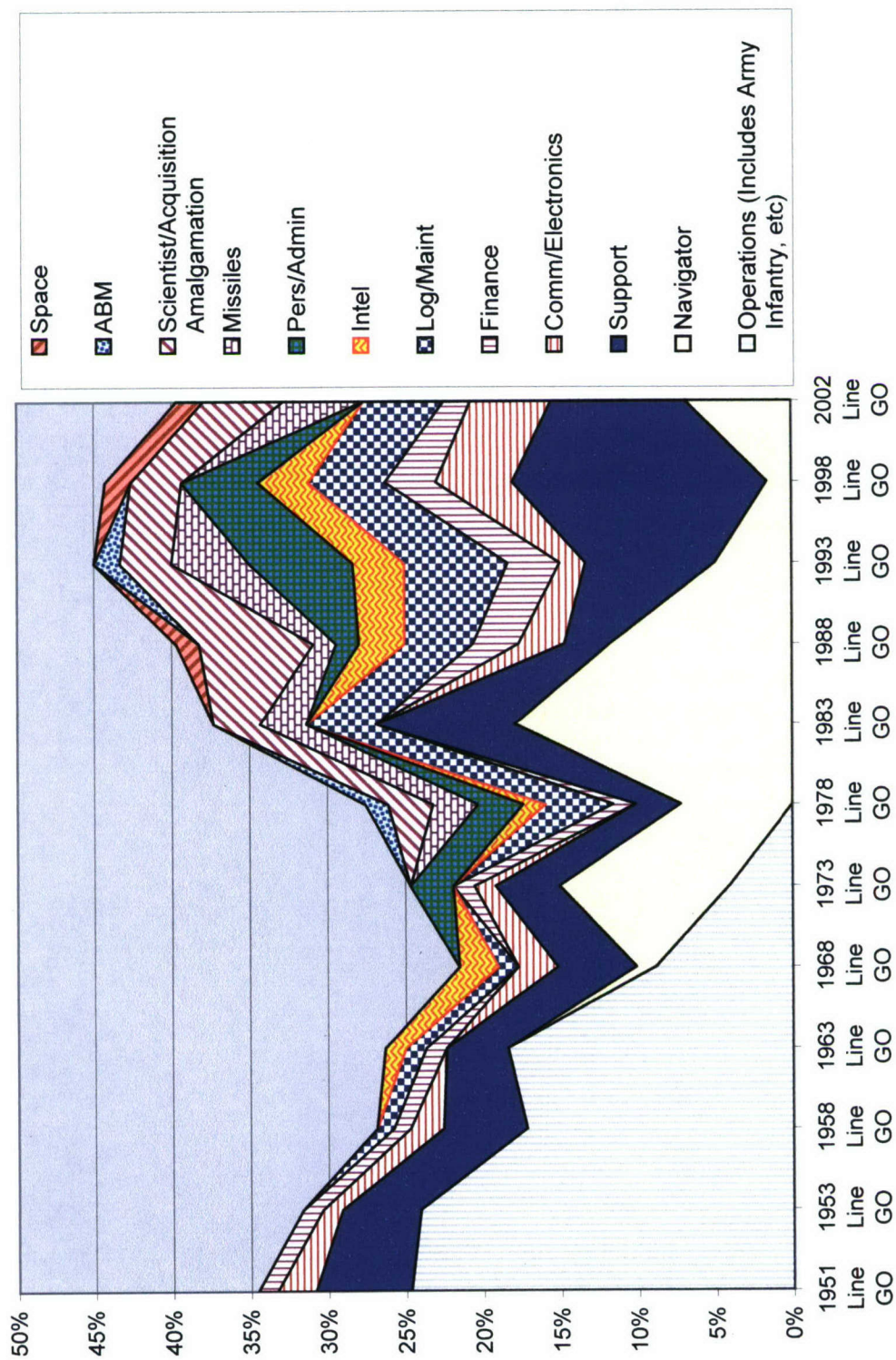
#### General Officer Air Force Specialty Codes

The chapter begins with an examination of Air Force Specialty Codes (AFSCs). AFSCs are the career field classifications that the officer corps assigns to each officer. In addition, duty billets are also categorized by AFSC requirement; so an officer's AFSC determines which duty billets he is eligible to fill. This study uses the term *initial* AFSC to indicate the specialty that an officer appears to have been assigned upon entry into active, commissioned service. The term *apparent* AFSC is used to characterize an officer's specialty as viewed over his career prior to becoming a general officer.<sup>293</sup> Over the course of the samples, the range of initial AFSCs has broadened considerably over the Air Force's history. See Chart 9-1 (GO Samples: Total Line General Officer Initial AFSC by Percent, Excluding Pilots). In the 1951 general officer sample, roughly 65% of the line general officers had gone directly into pilot training and service with the Air Corps. This was the case for all the graduates of the Aviation Cadet Program and many of the West Pointers. However, almost 25% of the line general officers initially served in non-flying Army billets outside of the Air Corps in, for example, the Coastal Artillery or Cavalry. Most of these officers then went to pilot

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<sup>293</sup> Following the Air Force's system of tracking of rated officers, once an officer is a pilot, he remains classified as a pilot regardless of what other jobs he performed. For further details on the coding, see Appendix A.

Chart 9-1: GO Samples: Total Line General Officer Initial AFSC by Percent, Excluding Pilots





training and transferred to the Air Corps, but some remained in their original specialties and branches and joined the Air Corps or Air Force in these non-rated capacities. Some of the officer pilots in the early Air Force general officer samples had actually left the Air Corps temporarily for career broadening tours in other Army branches before World War II.<sup>294</sup> The other 10% of the line general officers in the sample initially served in the three categories of communications/electronics, finance, and support.

*Communications/electronics* officers provided the obvious and important functions of communications and radar links for command and control of a global Air Force, from the control tower at the local field to Air Force units scattered around the world. The term *finance* is somewhat deceptive, because the term also includes statistics officers, who for example performed continual analyses of bombing missions during wartime in order to develop methods to increase bombing effectiveness and efficiency. In addition, early Air Force computer development occurred in both the communications/electronic and finance areas. The term *support* is used in the general officer sampling as a catchall term for line career fields not specifically mentioned in the sampling.<sup>295</sup> Security police and civil engineers are examples of two such support functions that the Air Force required, and in these particular cases, had been provided to the Air Corps by other Army branches.

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<sup>294</sup> For example, in the 1951 sample Major General Robert M. Lee reported serving such a tour with the cavalry.

<sup>295</sup> The categories used in the general officer sampling are: Support, Scientist/Acquisition, Finance, Intelligence, Communications/Electronics, Personnel/Administration, Logistics/Maintenance, Operations, Space, Missiles, Air Battle Manager, Navigator, and Pilot.

Although the Air Force line general officer corps was close to 90% pilots in 1951, over a third of the general officers had actually served initially in non-flying, and often non-Air Corps, billets. This effectively gave the Air Force general officer corps of 1951 much broader perspectives on warfare and concepts of profession than successive samples. The percentages of line general officers who had initially served in non-pilot billets steadily declined from 1951 through 1968, and the 1951 percentage of these officers was not exceeded until 1983, and then the boost comes primarily from general officers who initially served as navigators, which does not provide quite the same broadening effect as non-flying experience. Nevertheless, general officers who had served as navigators eclipsed those who had initially served in non-flying operations as the largest initial classification category by 1973. In addition, by 1973, although only 25% of the line general officer sample had initially served in non-pilot billets, the number of initial career fields had risen to six, and by 1978 some Air Force line general officers had initially served in the following career fields: operations, navigator, air battle manager, missiles, logistics/maintenance, intelligence, personnel/administration, scientist/acquisitions, as well as finance, support, and communications/electronics. By 1993 line general officers who had initially served as navigators were in such a decline, that line general officers with initial tours in support exceeded the initial navigators as the largest initial job group outside of pilots. The 1988 sample yielded the first general officer who had initially served in the space field. The percentage of general officers who had initially served in non-pilot billets peaked in



1993 at 45%, but was still approximately 40% in 2002. However, a major difference between the 1951 and 2002 samples is that although 35% to 40% of the general officers in each sample had initially served in non-pilot billets, most of those in the 1951 sample went on to become pilots, while most in the 2002 sample stayed in non-pilot billets. See Chart 9-2 (GO Samples: Total Line General Officer Apparent Air Force Specialty Codes (AFSC) by Percent, Excluding Pilots).

Chart 9-3 (GO Samples: Total Line General Officer Change in Air Force Specialty Code (AFSC) by AFSC, by Percent), and Chart 9-4 (GO Samples: Total Line General Officer Change in Air Force Specialty Code (AFSC) by Year, by Percent) illustrate this phenomenon from a slightly different perspective. The group of general officers who started service in non-Air Corps operations tours initially provided the bulk of the officers who changed career fields to pilot. In the middle years, navigators made up the majority of officers switching to pilot, and in the later years a variety of non-rated fields provided officers who became pilots, but at a much reduced level. The charts indicate moves from fields of less status to those of higher status. Pilots obviously have high status, and the minor losses of pilots, to for example, astronaut, are more than compensated for by officers from other career fields becoming pilots. Navigators are generally losers, with many navigators moving up to pilot, but fewer non-rated officers moving to navigator and offsetting navigator losses. Communications/electronics, air battle managers, and intelligence are also losers, with no overall offsets, indicating very low status for these C4ISR fields. Nevertheless, there

**Chart 9-2: GO Samples: Total Line General Officer Apparent Air Force Specialty Codes (AFSC) by Percent, Excluding Pilots**

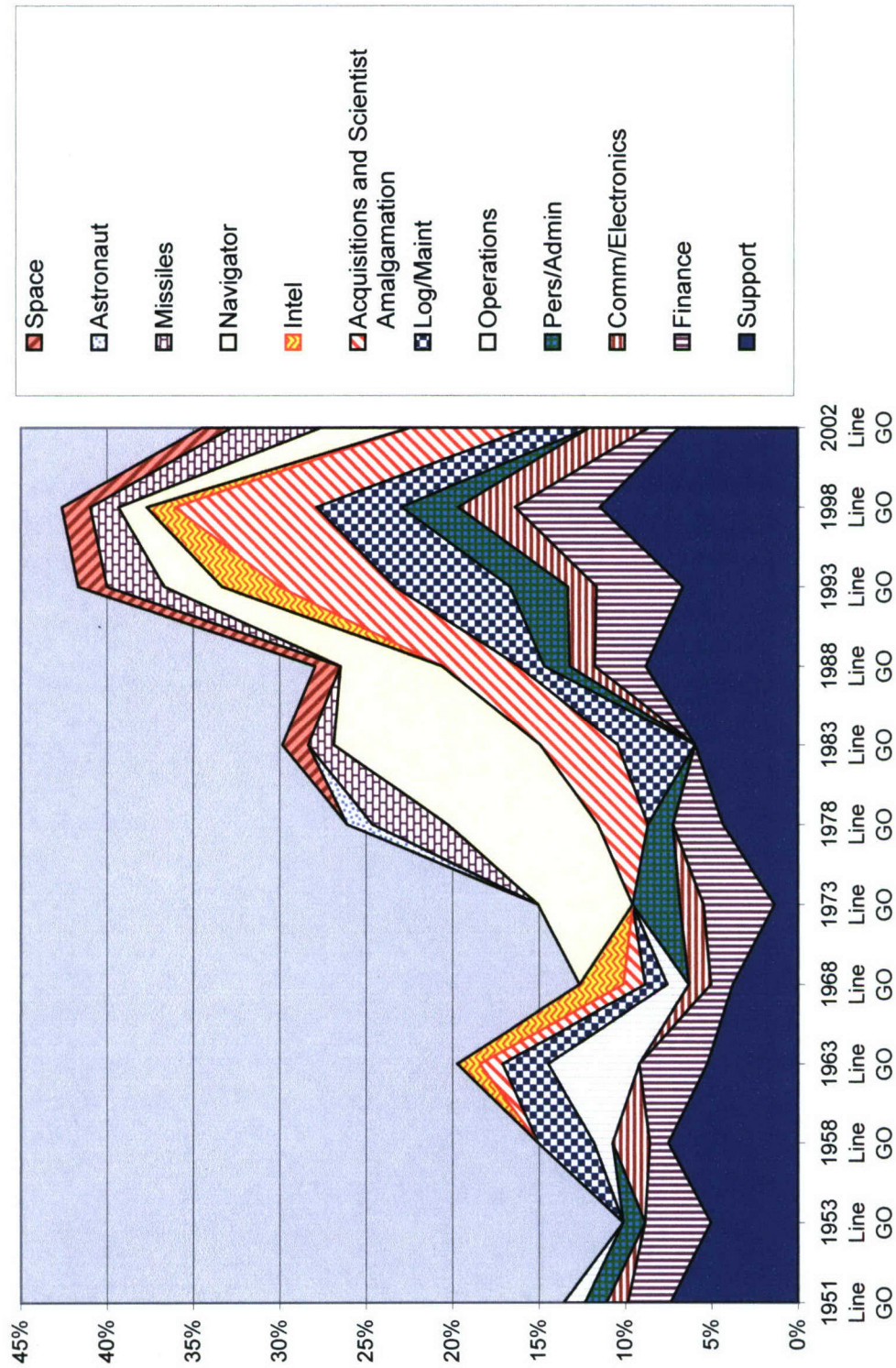




Chart 9-3: GO Samples: Total Line General Officer Change in Air Force Specialty Code (AFSC) by AFSC, by Percent

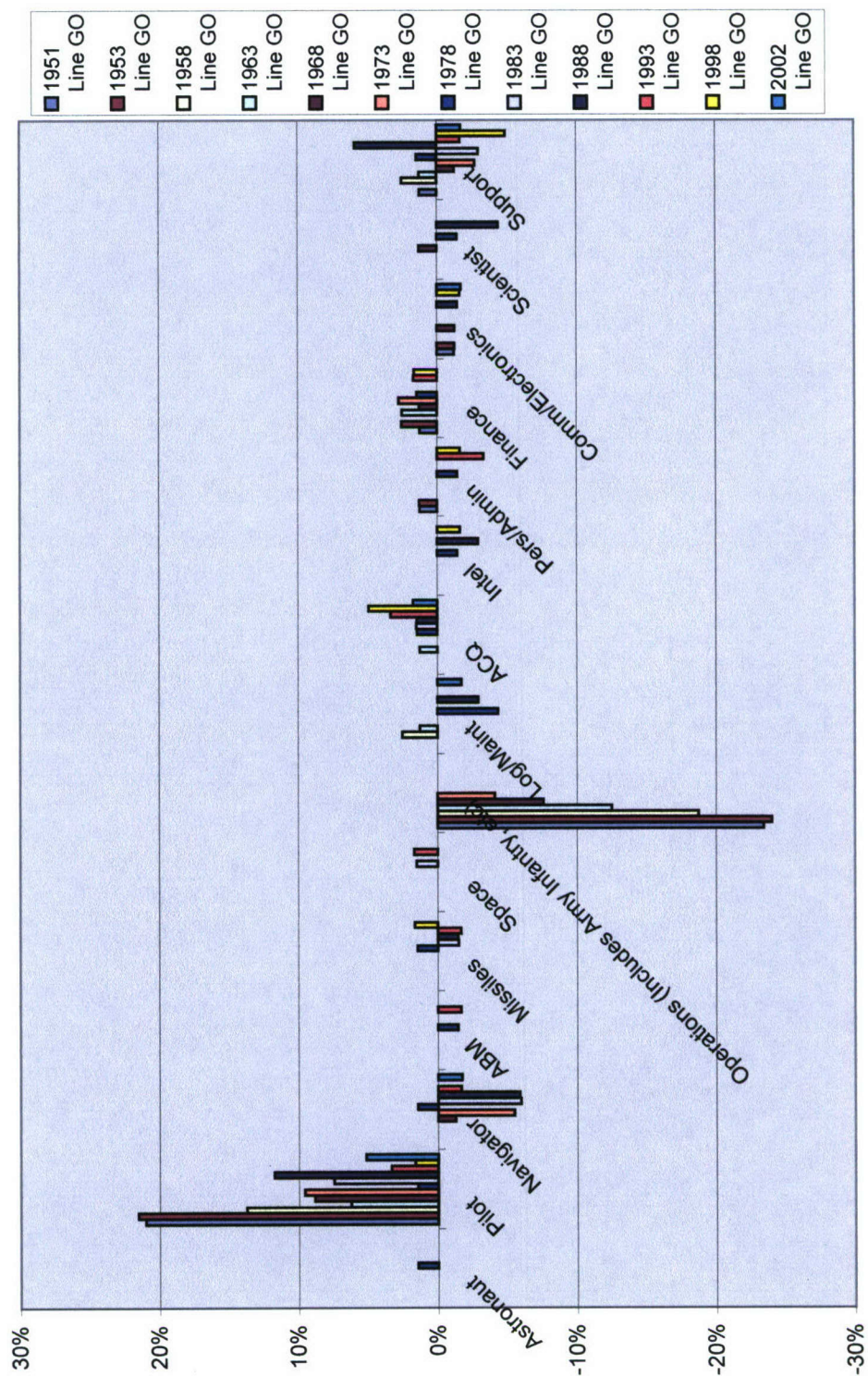
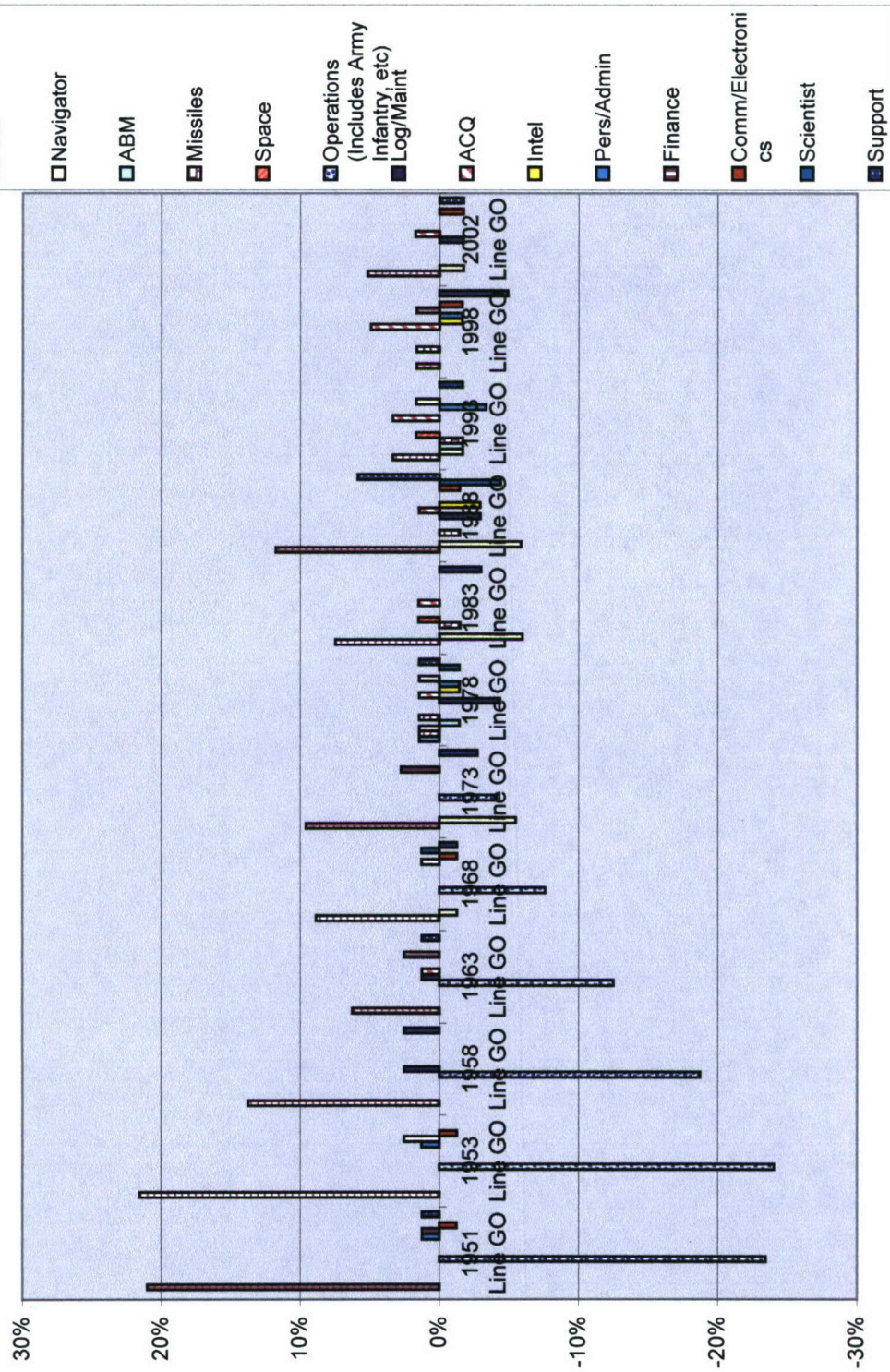




Chart 9-4: GO Samples: Total Line General Officer Change in Air Force Specialty Code (AFSC) by Year, by Percent





is at least one general officer in each sample except 1983 that is still an apparent communications/electronics officer by career field. The missiles field is mixed, with some losses and some gains, and space shows overall net gains. Acquisitions and finance are the only other overall net gainers. Logistics/maintenance, personnel/administration, scientist, and support all indicate mixed gains and losses. Since pilots and navigators retain their rated status for life as long as they remain healthy and meet their monthly hours or flying gates, the gains in the non-rated fields are typically from officers in other non-rated fields. Except for 1998, when acquisition's gains were higher, pilots have always had the highest annual net gains.

In the end, it is clear that not only the percentages of non-pilot officers generally increased across the samples from 1951 through 2002, but also that the diversity of apparent AFSCs among the non-rated general officers also increased.<sup>296</sup> This indicates a widening of the inner core of the profession. Officers from career fields that once could only provide colonel technical specialists to advise general officers have become worthy in their own right to enter the inner core as general officers. The data also indicates that a number of general officers in each sample have changed AFSCs during the course of their careers. This demonstrates that some career fields, such as pilot and space, are perceived to have status since both experienced net gains as officers changed career fields. Some career fields are losers, and some show mixed results. The second

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<sup>296</sup> It is not clear why the percentage of non-pilots general officers and the number of AFSCs represented decrease in 2002. It could reflect a random fluctuation, or a resurgence of the heroic warrior archetype in the aftermath of 9/11. However, since the Pentagon removed names from its phonebook in 2003, the sampling method used for the rest of the samples cannot be repeated after 2002. See Appendix A.

half of this chapter examines in detail the growth in the percentage of officers with C4ISR AFSCs.

#### Pilot Skills as Proxy Variables for Leadership and Decision-Making Ability

Although it is clear that the Air Force officer corps has traditionally used the pilot qualification as a prerequisite for advancement to the inner core of the profession, it is not clear that actual pilot skills serve as proxy variables for leadership and decision-making ability. In fact, in the old four-hours-a-month-for-flight-pay system, many officers in charge of weather and communications for example, barely fit the modern conception of a pilot. Of course they had the flying hours to make the command pilot rating, but multiple tours with flying units are noticeably absent in their biographies. They flew their hours almost as a hobby on the side of their real jobs in weather or communications, and they were not flying state of the art combat aircraft. Certainly the line general officer ranks have always been dominated by pilots and pilot images, but the general officer biography sample data indicates that relatively little emphasis was placed on a general officer's pilot skills until the 1960s and the Vietnam War. The sample data captured data in three categories that characterize whether a general officer could claim to be a pure heroic warrior in deed as well as in word. Quantitatively, one can look at an officer's total flying hours and/or an officer's combat flying hours or sorties listed in his biography. Qualitative indications of being a *hot stick*, i.e., an extraordinary pilot, were captured by recording whether an officer's biography references being an astronaut, a weapons school graduate, an ace, a member of an aerial



demonstration team like the Thunderbirds, a recipient of an aviation trophy or holder of a flying record, or a test pilot. Although these categories are obviously pilot-centric, navigators and some non-rated line officers might have had opportunities to accumulate flight hours, combat hours or sorties, and some of the hot stick subcategories. In fact, some of the hot stick subcategories, like the weapons school graduates, might actually have visionary archetype overtones.

The inclusion of a general officer's total flying hours in his biography provides no new information in most cases since the overwhelming majority of general officer pilots and navigators in the sample listed themselves as command pilots or master navigators. These ratings by themselves indicate that the holder has met the flying hour requirement for these highest of ratings, which in turn indicates that the holder spend the majority of his career on flying status and met his gates in the new system. Since the flying hour requirements for the command pilot and master navigator ratings have varied somewhat over time, the sample data was coded using categories of less than 1,000 flying hours, 1,000 to 2,500 flying hours, and over 2,500 flying hours. No general officers in the sample reported having less than 1,000 total flying hours, and only the occasional general officer admitted to having between 1,000 and 2,500 total flying hours.<sup>297</sup> The supermajority of general officers that reported total flying time had well over 2,500 total flying hours.

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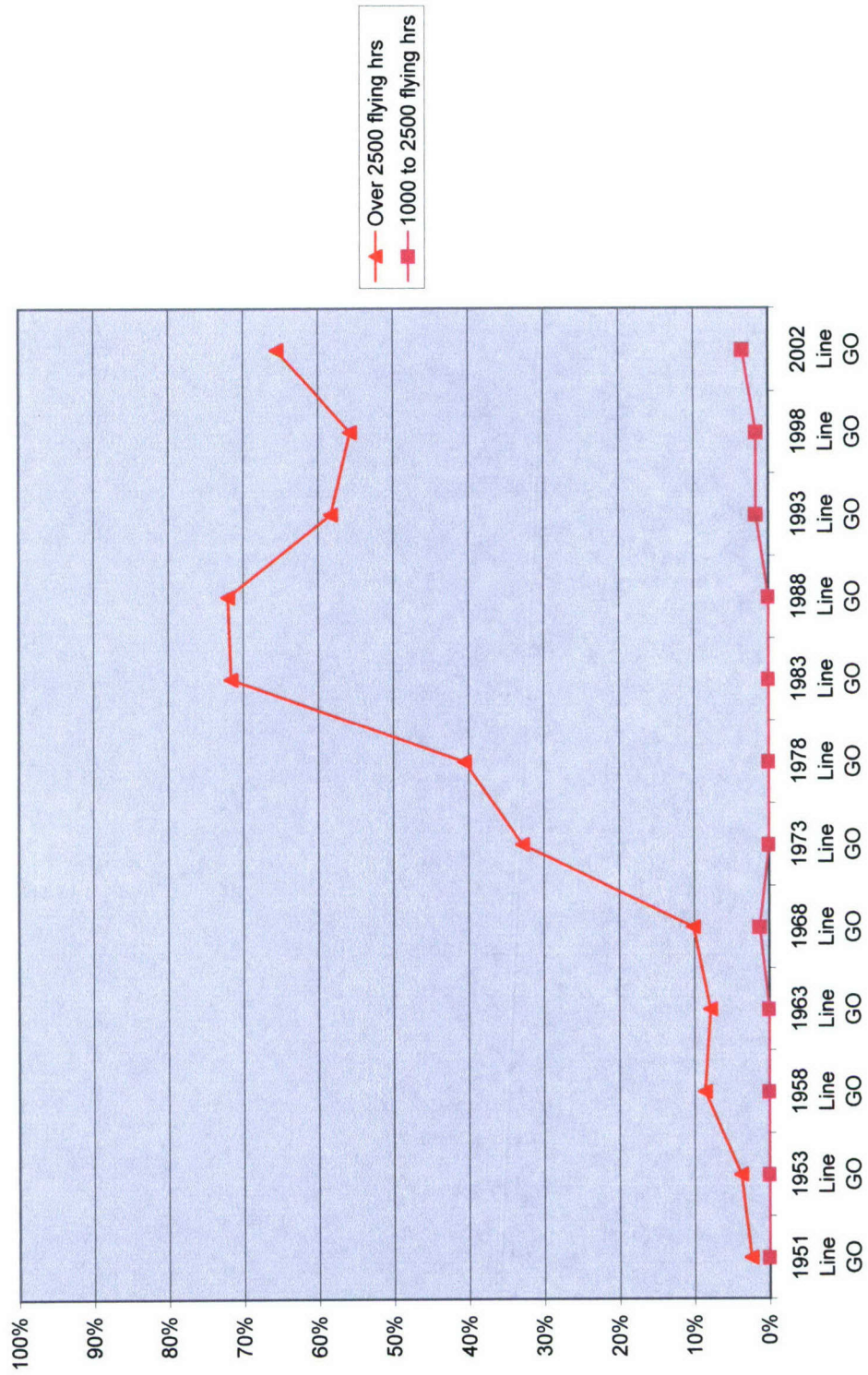
<sup>297</sup> No 4-star general officer in the sample listed a total number of hours within the medium category.

What is most interesting is that fewer than 10% of the general officers reported any total flying time until the 1968 sample. However, from the 1968 through 1983 samples, the percentage of line general officers reporting flying hours climbed from 11% to 72%. See Chart 9-5 (GO Samples: Total Line General Officer Flying Hours Listed In Biography by Percent). From the 1983 sample onwards, the curve loosely follows the percentage of general officers sampled who were pilots. The curve can be explained by several factors. First of all, since close to 90% of the general officer corps were pilots in the beginning years of the independent Air Force, there was no apparent need to reinforce the fact that an officer was a pilot by listing total flight hours. Second, there may have been a sense of modesty, or at least a sense of no need to brag about one's numbers of hours. After all, simply writing "command pilot" was sufficient in and of itself as the badge of ultimate flying skill. In fact, in the independent Air Force, the percentage of pilots who held the command pilot rating was less than 5% through 1956. Furthermore, since large parts of the initial Air Force general officer corps had been general officers during World War II with staff and planning responsibilities, many did not actually accumulate that many new hours in modern combat aircraft during the war, at least in comparison to their junior colleagues in flying units.

The big change towards reporting total flying hours apparent by the 1973 sample is the result of several factors. First, the general officers were now that crop of junior officers in World War II and Korea who had accumulated large amounts of hours, many of which were combat hours. In addition, Vietnam and the growing number of non-



Chart 9-5: GO Samples: Total Line General Officer Flying Hours Listed in Biography by Percent



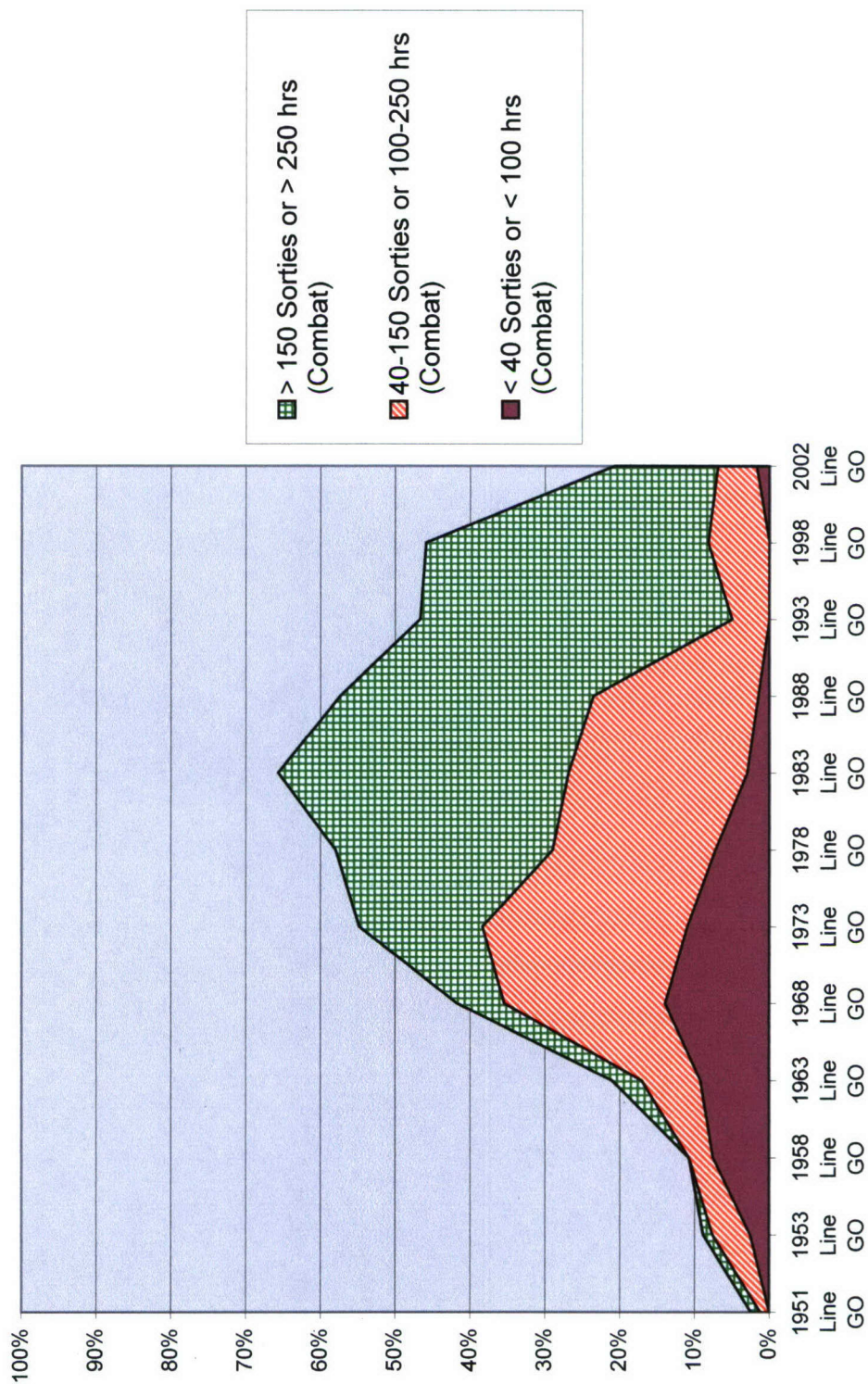
rated general officers probably contributed to the trend. As junior officers flying in Southeast Asia increasingly earned large numbers of combat flying hours and sorties, general officers may have begun to list their total flying hours as a way to maintain credibility. From this perspective, the general officer biographies appear to be sending the message that some captain's 150 combat flying hours in Vietnam were of minimal significance in comparison to a general's 4,500 total flying hours. Furthermore, since roughly a third of all Air Force pilots held the command pilot rating between FY1959 and FY1973, adding the total flying hours may have been an attempt to gain increased status by showing how far a general officer had exceeded the standard. In addition, a biography with a sentence like, "the general is a command pilot with 5,000 hours flying assorted fighter aircraft" strikes a chord within the officer corps. It stakes a claim that the general is a part of the inner corps of the officer corps, not only with respect to rank, but because each hour is another point in some sort of tally of professional skill. More hours are better since in the absence of qualitative indications they signify more professional competence and, therefore, more credibility that this particular officer has what it takes to make decisions and assume positions of authority and responsibility within the officer corps. At the same time, it is clear that there is more to becoming a general officer than accumulating thousands of flying hours. Many pilots with large numbers of flying hours do not become general officers. Nevertheless, career flying hours are significant, and having enough to qualify for the command pilot rating or master navigator rating seems to be the desired minimum for rated officers to be



considered for promotion to general officer rank. Furthermore, the apparent standardization of the inclusion of total flying hours in general officer biographies in the 1980s through 2002 and beyond has had the powerful effect of highlighting the absence of flying hours in a biography. The absence of the flying hour phrase reinforces that the officer is not a pilot or navigator, and attempts to substitute a master-level non-rated badge in lieu of flying hours fall flat. Consequently, flying hours, which were once meaningless and not included in biographies, have become a subconscious proxy for professional competence.

Whereas the reporting of total flying hours in the biographies has evolved from a valueless fact to a reinforcement of the importance of flying experience and the heroic warrior to the profession in the face of rising numbers of non-rated general officers, total flying hours can be trumped by combat flying hours or sorties. Although listing a single combat sortie might appear insignificant in comparison to several thousand total flying hours, the inclusion of combat experience, however small, stakes a claim that that the flier is brave, has faced death at the hands of the enemy, and presumably kept a cool head under the added stress of combat. To the heroic warrior, flying combat hours and missions are the epitome of the profession. It is no surprise then, that greater percentages of general officers reported their combat flying hours or sorties earlier than their total flying hours. See Chart 9-6 (GO Samples: Total Line General Officer Combat Hours/Sorties Listed in Biography by Percent). The combat hours/sorties curve also rises faster than the total flying hours curve, although it does not reach the same

**Chart 9-6: GO Samples: Total Line General Officer Combat Hours/Sorties Listed in Biography  
by Percent**





heights since many officers rise to general officer ranks without combat experience, which of course is evidence of a more visionary outlook within the general officer corps. In addition, some officers, presumably with minimal combat experience, do not list specific hours or sorties, and could therefore not be categorized. It also appears to be somewhat subjective as to what is counted as "combat" experience. A FAC flying an O-2 along the front lines, a C-141 crew ferrying supplies to a rear base, and an EC-121 flying over the Gulf of Tonkin all faced quite different levels of risk during the Vietnam War but all might have logged combat time.<sup>298</sup> In addition, because of different rules governing lengths of combat tours in effect at different times, some officers were automatically rotated out of the combat theater upon reaching a certain number of sorties; but another set of officers arriving shortly thereafter might have had to stay until hitting a higher number of sorties, or serving a set amount of time, regardless of the sorties flown. Consequently, there is more diversity with respect to how many combat hours or sorties general officers reported.

The curve is also somewhat paradoxical since officers who were generals and colonels in World War II often did not fly that many combat missions in World War II or in Korea because they served on staffs and in senior positions during those wars. However, many stayed on active duty into the 1960s; some of the increased reporting of

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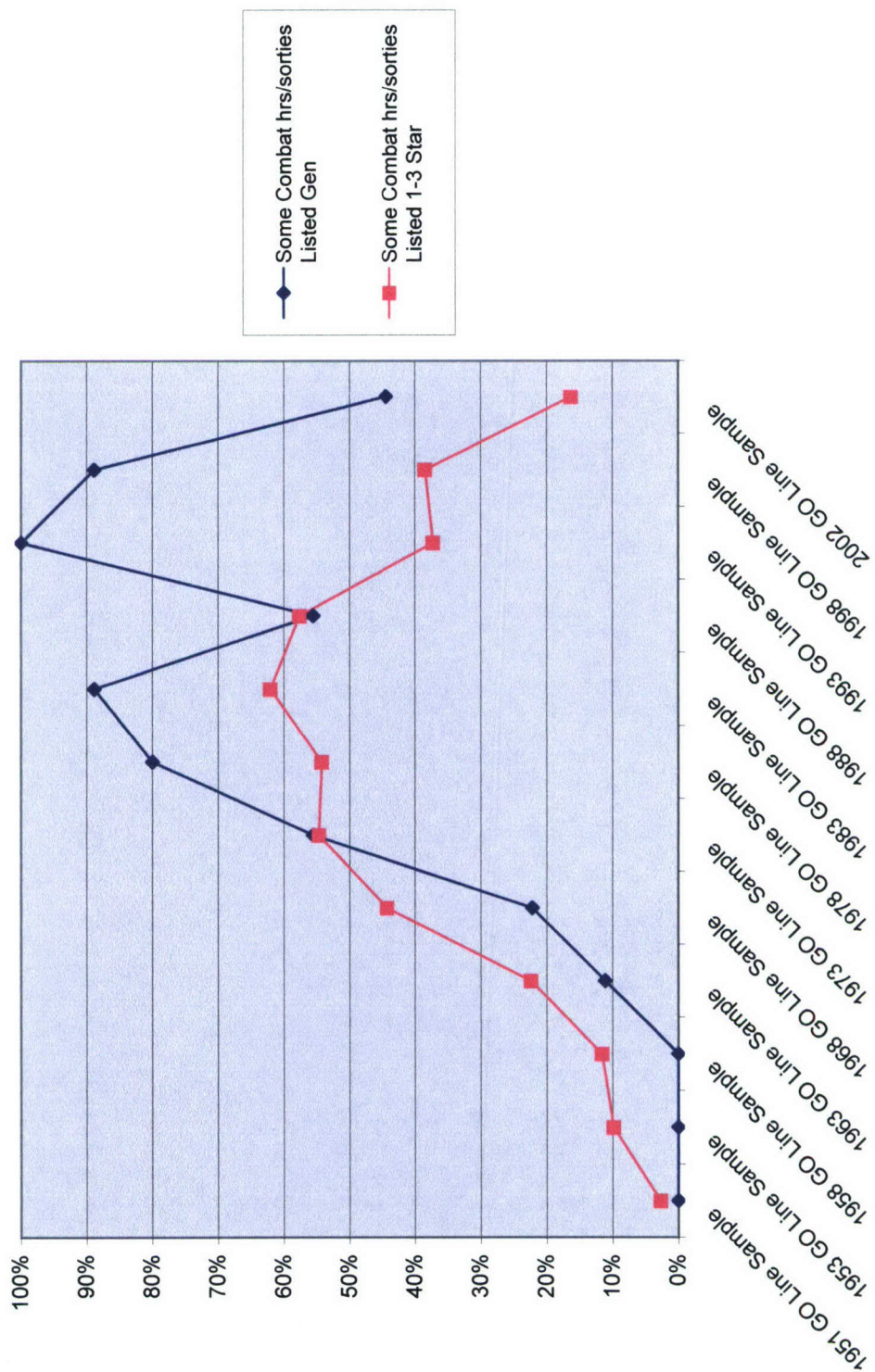
<sup>298</sup> In addition, the Air Force has varied its criteria for what constitutes a combat, combat support, or essentially peacetime mission flown in the theater of operations. It is typically the aircraft commander's call as to how to log the sortie and the flying hours. Furthermore, it is possible that some officers are saving space and simply conveying the message that they flew in "combat," without breaking down the hours or sorties into combat and combat support.

combat hours in the mid 1960s reflects younger World War II fliers becoming generals, and not young Vietnam fliers being quickly promoted to general officer ranks. Consequently the big hump in the percentage of combat hours/sorties reported between the 1968 and 1988 samples reflects a hodge-podge of combat experience by various officers from World War II, Korea, and Vietnam. Desert Storm experience had yet to make a significant impact in the 2002 sample; one can expect another wave as officers with combat experience from Desert Storm, operations in Southwest Asia and the Balkans, and the Global War on Terror are promoted to general officer ranks. This in turn raises the question of relevancy of the reported combat hours/sorties that often reflect missions flown 20 years earlier. The officers undoubtedly demonstrated courage and embody the heroic warrior archetype, but the actual experience may not be particularly relevant given the changes in aircraft, command and control technology, weapons, tactics, and doctrine during any 20-year period in the Air Force's history. This gap between a general officer's actual combat experience and the technology and systems in contemporary use would seem to foster the division between the heroic warrior and visionary archetypes. The old ways invariably appear more heroic than the modern, technology-dependent systems.

Chart 9-7 (GO Samples: General versus 1-3 Star General Officers – Some Combat Hours/Sorties Listed) portrays a shift in the emphasis that the officer corps attaches to combat experience. In the 1951, 1953 and 1958 samples, no 4-star general officers sampled reported combat hours/sorties. These officers had served as general



Chart 9-7: GO Samples: General versus 1-3 Star General Officers -- Some Combat Hours/Sorties Listed

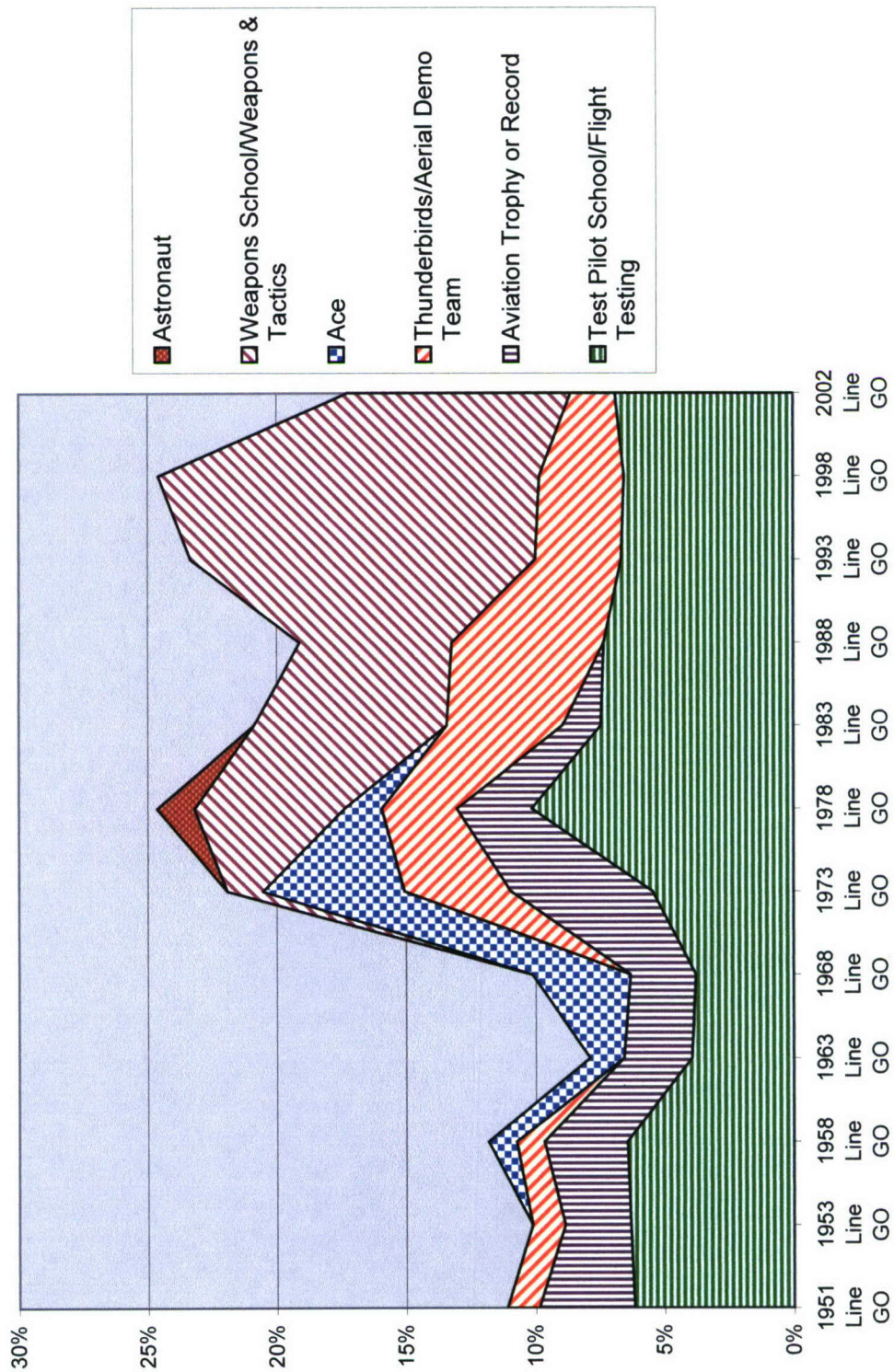


officers during World War II and worked in strategic, or more visionary, roles during the war and had minimal combat experience. However, some of the 1-3 star generals, who had served in lower level positions during World War II had accumulated more combat hours and reported them in their biographies. They were no doubt proud of their accomplishments, and were perhaps implicitly arguing that the future senior Air Force officer corps leadership should belong to flying officers with combat experience. Once members of this generation of officers began to reach 4-star ranks, they quickly surpassed the 1-3 star percentages of general officers reporting combat experience. Whereas the percentage of 1-3 star general officers reporting combat hours/sorties peaked in the 1983 sample at just over 60%, the 4-star percentages ranged from 80% to 100% from the 1978 through 1998 samples, except for the anomaly of the 1988 sample. Consequently, the historic trend at the 4-star general officer level illustrates a shift from a visionary emphasis to an almost demand for heroic warrior combat experience, at least in rated general officers.

The final category concerning a general officer's flying ability is the qualitative hot stick category. This category tends to follow the trends observed in the total flying hours and combat hours/sorties categories in that the percentage of general officers reporting hot stick experience was lower and relatively flat from the 1951 sample into the 1960s, before climbing steeply and remaining at a much higher level afterwards. See Chart 9-8 (GO Sample: Total Line General Officer "Hot Sticks" by Percent). One can roughly categorize the percentage of general officers who are hot sticks at 10%



Chart 9-8: GO Sample: Total Line General Officer "Hot Sticks" by Percent



from the 1951 through the 1968 samples; from the 1978 through 1998 samples the range increases to the 20% to 25% level. This in turn indicates a doubling in the importance attached to general officer flying skills. This, however, masks a tension between the heroic warrior and visionary archetypes inherent in the hot stick category.

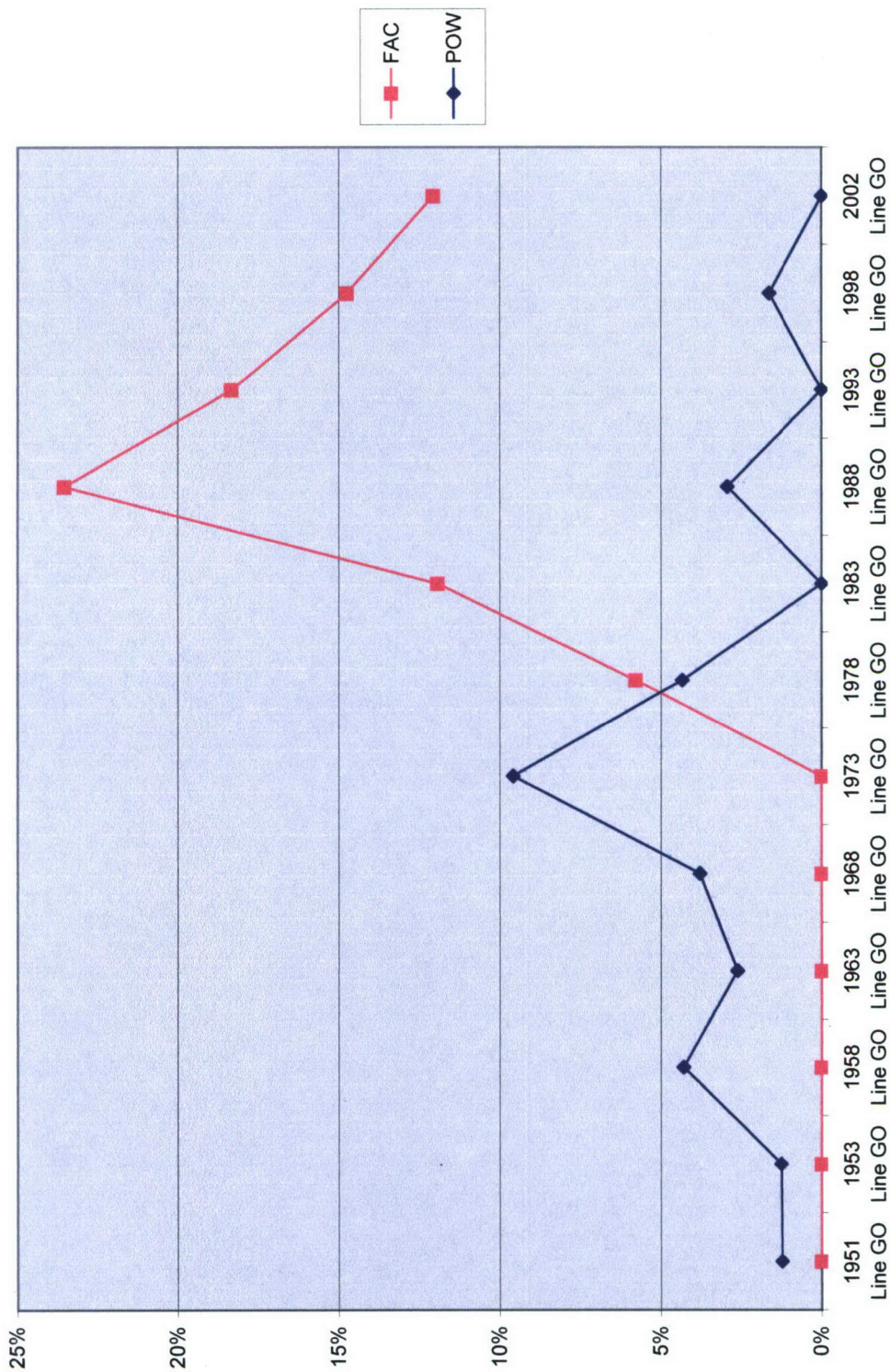
The Fighter Weapons School (FWS) category, which includes officers who were graduates of a weapons school, instructors at a weapons school, or served as weapons and tactics officers accounts for a large part of the hot stick category from the 1978 sample onward. From the heroic pilot warrior perspective, the FWS is a peacetime ace program. The FWS provides a way to recognize tactical hot sticks throughout the Air Force during peacetime, to teach them to become better tactical combat fliers, and to have them share the combination of their acquired knowledge and inherent flying skills with other aircrews. The FWS' emphasis on flying skills and decision-making during free-flowing tactical engagements stands in stark contrast to the heavy scripting of missions flown by astronauts, modern test pilots and aerial demonstration teams. Consequently, the FWS subcategory rivals acedom as a method for determining which pilots possess that special combination of inherent flying skill, nerve, intelligence, and luck – that *right stuff*. If the description is constrained to flying attributes, it defines the heroic pilot warrior. However, since the FWS emphasizes the role of weapons and technology on tactics, it has led the Air Force officer corps in integrating first air battle managers in the mid-1980s, and then other C4ISR officer specialties like intelligence and space into its curriculum. Thus, the FWS has evolved from an emphasis on the



heroic warrior fighter pilot to a visionary integration of C4ISR and tactical air operations.

Although Forward Air Controllers (FACs) were not included in the hot stick category and chart, they form another piece of this complex discussion. FACs are not automatically hot sticks since receiving a FAC assignment directly out of undergraduate pilot training during the Vietnam War was interpreted to mean that the officer's flying skills were not good enough to get an F-4. After all, an O-2 did not require much flying skill. However, the FAC job required tremendous organizational skill and a sharp mind. The job also became not only the crossover link between the command and control world and the fighter pilot; it was also where all the action was. Consequently, some pilots volunteered for FAC duty. In addition, the Air Force also experimented with "fast FACs" flying modern fighters at speed and altitude, but still working as the interface between the ground unit, command and control system, and fighter aircraft striking targets in close proximity to the supported ground unit. FACs can also serve on the ground, and navigators can also serve as FACs. Consequently, FACs demonstrate heroic warrior and visionary characteristics and are treated as a separate, but similar category to hot sticks. In the 1988 sample there was in fact a higher percentage of general officers who listed FAC experience in their biographies than the total hot stick category. See Chart 9-9 (GO Samples: Total Line General Officer "Not A Hot Stick" by Percent). General officers who reported being Prisoners of War (POW) are included in the "not a hot stick" table since being shot down would seem to indicate that the

Chart 9-9: GO Samples: Total Line General Officer "Not A Hot Stick" by Percent





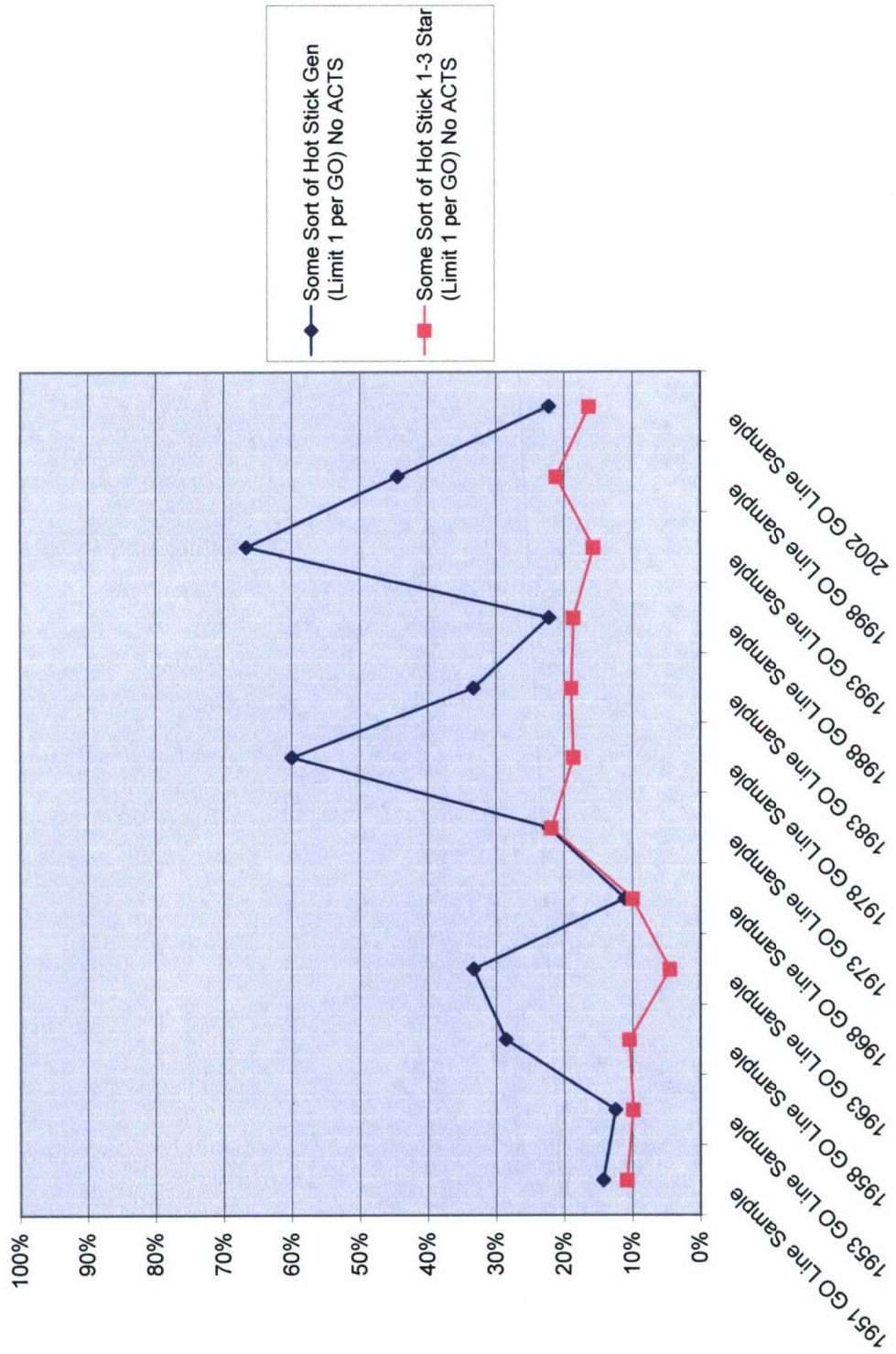
officer somehow lacks the right stuff. Interestingly enough, several such officers still made it to general officer rank, which one would think would be impossible in a pure heroic pilot warrior officer corps. However, no 4-star general in any sample ever reported being a POW.

With respect to differences between 4-star generals and 1-3 star general officers in the hot stick category, the interesting point is the number of 4-star generals listing these type duties given the relative scarcity of such duty among the 1-3 star general officer samples. This would appear to indicate a preference for 4-star heroic pilot warrior-type generals, although not a big demand for such characteristics in the 1-3 star ranks. Take aces for example. The 1958 and 1963 1-3 star general officer samples list one ace each, and the 1968 and 1973 1-3 star general officers samples each list two aces. At the 4-star general level, the 1968 and 1978 samples each list one ace, and the 1973 sample lists two. Consequently, half of the general officer aces in the 1973 sample are 4-star generals.<sup>299</sup> Chart 9-10 (GO Samples: General versus 1-3 Star General Officers –Hot Stick – Any Kind) shows that at the aggregate level the percentage of 4-star hot sticks per sample equals or greatly exceeds the 1-3 star percentage. Membership in the Thunderbirds or another aerial demonstration team and the FWS category remain represented by at least one general officer in the 4-star samples from 1978 onwards. In fact, those two categories account for two-thirds of the 4-star peaks in the 1978 and 1993 samples. The situation with respect to FACs is

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<sup>299</sup> There have not been any Air Force aces since the Vietnam War.

Chart 9-10: GO Samples: General versus 1-3 Star General Officers -- Hot Stick -- Any Kind





somewhat similar to the hot stick data. Once again, at least one 4-star general in each sample from 1973 through 2002 reported serving as a FAC, and 4-star general officer percentage of FACs exceeds the 1-3 star general percentage in every sample from 1978 through 2002, except in the 1988 sample when the 1-3 star percentage exceeds the 4-star percentage by two percent. The 4-star general officer level appears to value the heroic pilot warrior image, although the inclusion of the FWS and FACs in this image means that associated visionary aspects could in fact be the real emphasis. C4ISR could be making inroads in the profession along the lines of a wolf masquerading in sheep's clothing.

#### Command

Although it is clear that command of flying units no longer has anything to do with leading flying units in combat, command is still an important variable because it has become part of the standard biography litany. General officer biographies from the 1980s onward almost uniformly contain an entry on flying and/or combat hours and another entry on command experience. These two entries have become so standard that absence of either one is immediately apparent and signals that something is different with the particular general officer. The implication is that the officer's claim of professional competence is incomplete because it is not grounded on the twin pillars of flying experience and command. Realistically, neither is a credential of professional competence, but both have become associated with senior leadership qualifications in

the Air Force officer corps.<sup>300</sup> At best, both traits serve as proxy variables for leadership skills, the ability to make good decisions with incomplete or conflicting information in stressful situations and the other characteristics von Clausewitz termed *military genius*, which are nearly impossible to quantify and measure. The cultural acceptance of the proxy variables as actual defining characteristics of what the officer corps wants in its leadership runs into problems as the officer corps seeks to shift its emphasis and to broaden its jurisdiction in C4ISR as technology continues to shift the character and nature of warfare away from onboard piloted vehicles. Flying hours and combat sorties become meaningless in the traditional sense when the *pilots* are monitoring computer screens in Nevada while the aircraft are bombing targets in Iraq. Command of flying squadrons, groups and wings has long lost meaning in combat operations, but it remains a pillar of professional competence, partly because the Air Force officer corps has failed to develop new, pertinent pillars.<sup>301</sup> At the same time, the

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<sup>300</sup> In fact, the Air Force added a commander's badge to the uniform in 2002, making it immediately apparent to all whether an officer has served as a commander at the squadron level or higher. The commander's badge is worn on the opposite side of the chest from the wings (and ribbons), so a balanced officer sports both.

<sup>301</sup> Although it was clear by the Vietnam War that combat command above the flight level was migrating to the command and control system, the Air Force officer corps preferred to treat this development as a wartime aberration. Peacetime training did not require an extensive and invasive command and control system dictating training sorties. Training was best handled at the local squadron level, and the squadron, group and wing structure was a time-tested and proven organizational entity. In addition, it was obviously easy enough to piece together a tactical combined air operations center with accompanying C4ISR since it had been done in World War II, Korea, and Vietnam. Consequently, there was also no need to waste too many resources organizing, building and training such structures in peacetime. After all, why trap a bunch of pilots, who would obviously be necessary to run the operations centers, in non-flying, dead-end jobs in the gated flight pay world. Even air defense operations centers were not given command over flying assets in peacetime, and a structure without assets is an empty shell. Furthermore, command experience was valued, and more straightforward, in the other services. In order to compete for its share of senior joint jobs and for its officers to have credibility in them, it was important for the Air



inclusion of command as a pillar means that non-pilots can also build a command pillar, even if historical restrictions to command constrain opportunities to build as high or as solid a pillar.

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Force officer corps to be able to define structural equivalents. For example, squadrons are typically commanded by lieutenant colonels and have some level of staff, personnel, and equipment. Consequently, they are seen as battalion equivalents, even though squadrons vary dramatically in terms of people and equipment, and do not actually serve as a fighting unit. If the Air Force was to use the CAOC, in its current configuration, as a fighting level of command, the Air Force would have no level of apparent combat command below the mid-general officer level. Although true, it would make competition for joint jobs difficult because there would be no apparent functional level equivalent to companies, battalions, brigades or divisions, or ships for that matter. In addition, there is no real career path that prepares officers for CAOC command, and the CAOC has no standard level of assets assigned to it. Although the Air Force officer corps could think of its combat CAOC C4ISR structure along the lines of task forces, it does not. Whereas Army units and navy ships contain internal C4ISR systems that can theoretically take on the responsibility for units subordinated to them, the Air Force officer corps historically separates functionality. Fighters are in one wing, bombers in another, AWACS in a third, communications in a fourth, intelligence in a fifth, and CAOCs for tactical operations are put together on an ad hoc basis. The Air Force officer corps has experimented with composite wings to match peacetime structures with the way it fights. The composite wing, made up of several types of aircraft, provides a basis for building strike packages or other tactical flying functions out of one wing. Such a wing may even have a radar unit attached, but it makes no attempt to provide CAOC C4ISR functions. At best, a composite wing provides a force to implement a CAOC's plan. However, composite wings are expensive since they lose the economies of scale associated with a wing using only one type of aircraft. Consequently, the Air Force officer corps developed the current system of building air expeditionary packages from various wings and pieces of wings, and rotating them through deployments. These do not provide internal CAOC C4ISR functions either. Outside of air defense, there has been limited professional interest in quality permanent CAOC C4ISR structures, which would be the basis for creating task forces. In the absence of something better, the vestigial wing, group, squadron organizational structure remains.

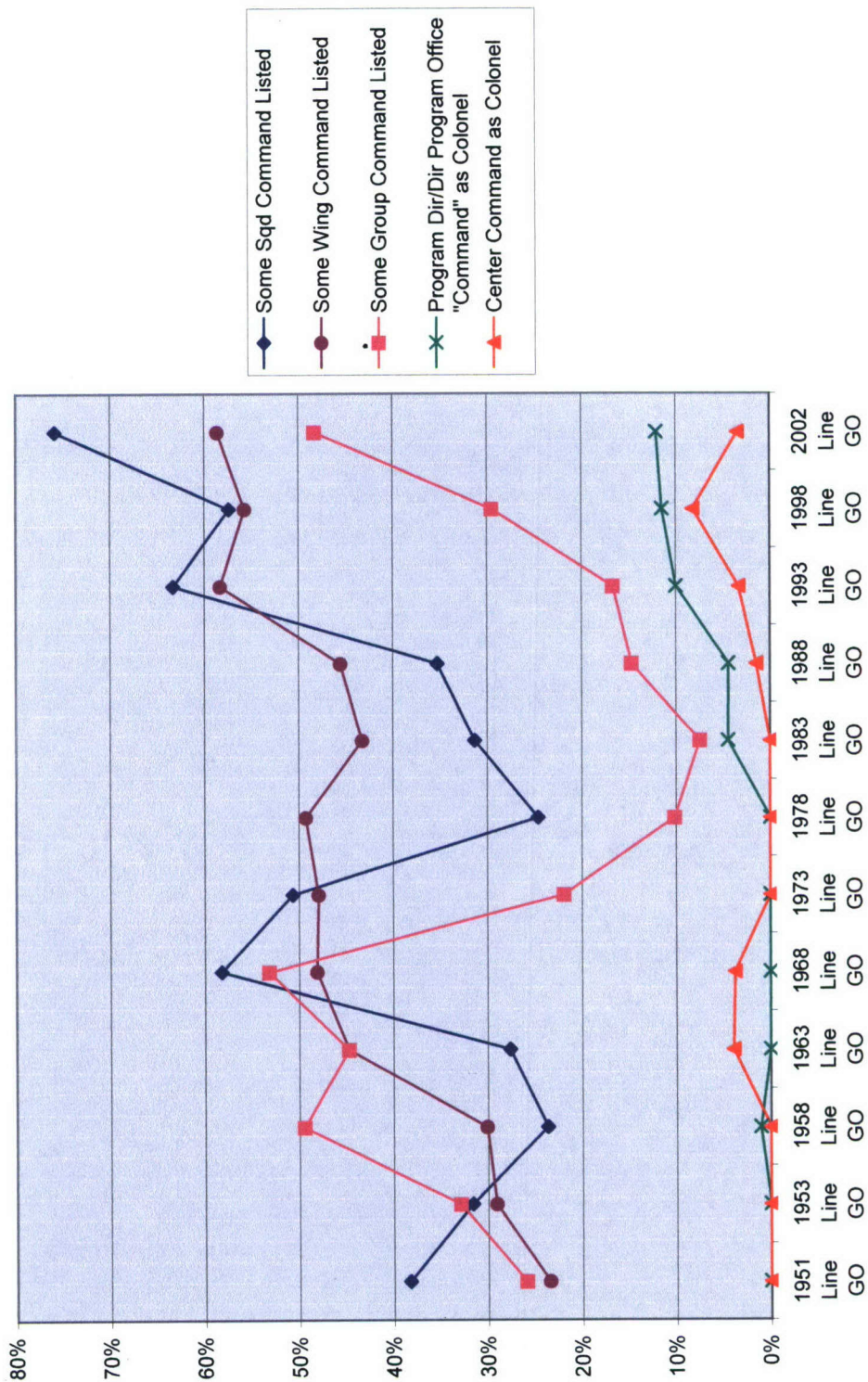
This is not to say that the Air Force officer corps was oblivious to its need for CAOC C4ISR structures. It was clear that unit-level flying training had clear limitations in terms of numbers of aircraft available per day, airspaces that were considered big in the 1940s, but completely within a fighter's radar coverage in the 1980s, and a lack of training opportunities against other types of aircraft. The Air Force officer corps sought to redress these problems and the equally important decline in combat experience among its younger pilots by instituting Red Flag in 1975 and a host of other "Flag" training exercises. Red Flag brought different types of aircraft from different units together to fight mock air wars over an extensive instrumented range. The Red Flag staff simulated a combined air operations center with an extensive C4ISR system, generated Air Tasking Orders, provided the opportunity for the fliers from the different units to mission plan together, used AWACS or the ground-based range command and control system to monitor and control the air battle, and then debriefed the entire thing. This cycle would be repeated one to two times a day for a two-week session for a single group of participants. Red Flag essentially trained aircrews to work within a CAOC C4ISR system without training or developing the CAOC C4ISR system itself. In the mid-1990s, with lessons from Desert Storm and its aftermath as well as from the Balkans operations, the Air Force officer corps placed a new emphasis on the CAOC C4ISR system. However, the officer corps still sees command existing primarily within the squadron, group, wing structure.

Chart 9-11 (GO Samples: Total Line General Officer Wing, Group, Squadron, Center or Program Director Command by Percent) provides a comparison of the percentages of wing, group, and squadron, as well as center and program director colonel-level command reported in the general officer samples. Center command and program director or director of a program office are included because the officer corps instituted them as commands in a visionary attempt to equate modern organizational structures with the older, more established squadron, group, wing structures. Centers tend to be function specific, and program directors or offices occur in acquisitions. Neither typically has the manning, equipment or aircraft of a group or wing, but center commanders and program directors frequently have rank and responsibilities that are at least commensurate with group or wing command. Consequently, the Air Force officer corps has attempted to equate the positions and increase their status, perhaps partly as a way to encourage rated colonels to take such jobs.

The group command and wing command curves are similar to the combat hours/sorties discussion above in that many of the offices quickly elevated to general officer ranks in World War II skipped the group and wing command levels. Consequently, as more officers who were more junior during the war become general officers, the percentages of general officers with group and/or wing command experience increases. However, the percentage of officers reporting wing command appears to level from the 1963 through the 1988 sample in the mid to upper 40s % range. It was not until the 1993 sample that over 50% of the general officers reported



Chart 9-11: GO Samples: Total Line General Officer Wing, Group, Squadron, Center or Program Director Command by Percent

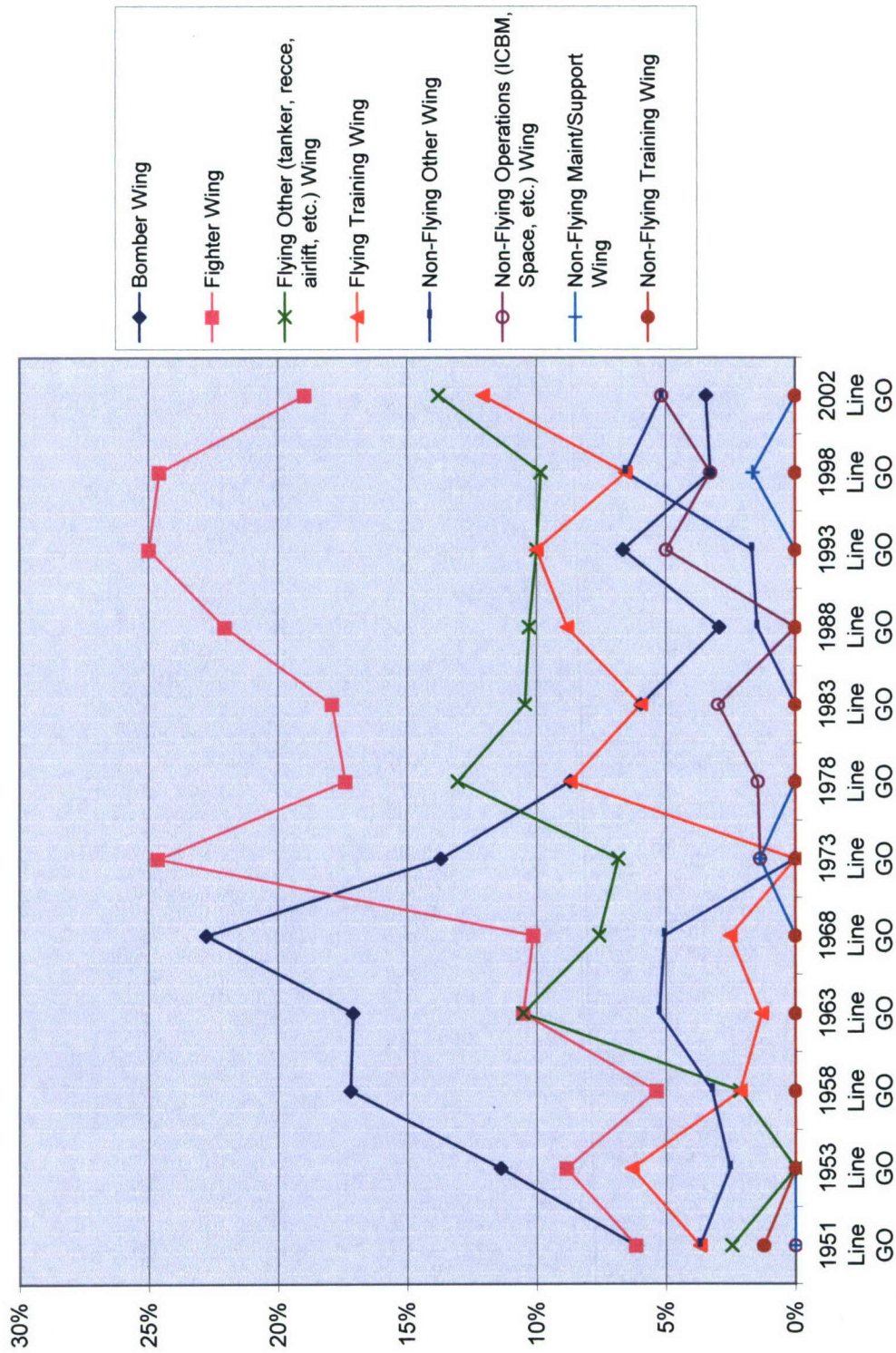


some type of wing command, which indicates a rather late boost in the significance of wing command at a time when wing command opportunities were decreasing because of the post Desert Storm and post Cold War drawdown. Nevertheless, wing command is particularly noteworthy because there are fewer opportunities for wing command, with approximately three squadrons per wing, and because it is frequently the last stop prior to promotion to general officer rank. However, with less than 60% of the sampled general officers ever reporting some form of wing command, the apparent importance attached to command as a pillar of professional competence in modern general officer biographies may be misleading. The percentage of general officers reporting group command drops dramatically in the 1973 and 1978 samples, reflecting the demise of the group-level administrative and tactical role. The increase in group command from 1983 through 2002 reflects a reorganization of the typical wing structure into functional groups, e.g. an operations group or a logistics/maintenance group, each replete with a “commander” who has few of the earlier group command tactical and command functions.

Chart 9-12 (GO Samples: Total Line General Officer First Wing Command by Percent) provides qualitative data on the type of wing command first reported in an officer’s biography. The initial importance of bomber wing command is evident, with a peak of 23% of the general officers reporting command of a bomber wing in the 1968 sample. Command of a fighter wing quickly peaked in the 1973 sample, then decreased in the post Vietnam drawdown, only to surge back to 25% in the post Desert Storm



Chart 9-12: GO Samples: Total Line General Officer First Wing Command by Percent



1993 sample. Fighter wing commands remained dominant with 19% of the line general officers still reporting them in the 2002 sample. However, over the samples, the importance of flying other wings, which contain airlift, tankers, and surveillance and reconnaissance aircraft for example, has steadily increased to the point where 14% of the line general officers reported this type of wing command. Command of a flying training wing and acquisitions “command” as a program director or director of a program office were both reported by 12% of the general officers in the 2002 sample. The later samples also show an increase in the percentage of officers reporting command over non-flying wings, although these wings are often commanded by fliers. In fact, in the 1988 sample, 31% of the line general officers reported that their first or only wing command was non-flying or a command over a center or as a program director of program office (not presented graphically). In the 2002 sample, it was still 25%, which indicates a clear visionary trend in the last three samples. Officers with non-flying wing-level command experience were valued enough to promote to general officer ranks.<sup>302</sup>

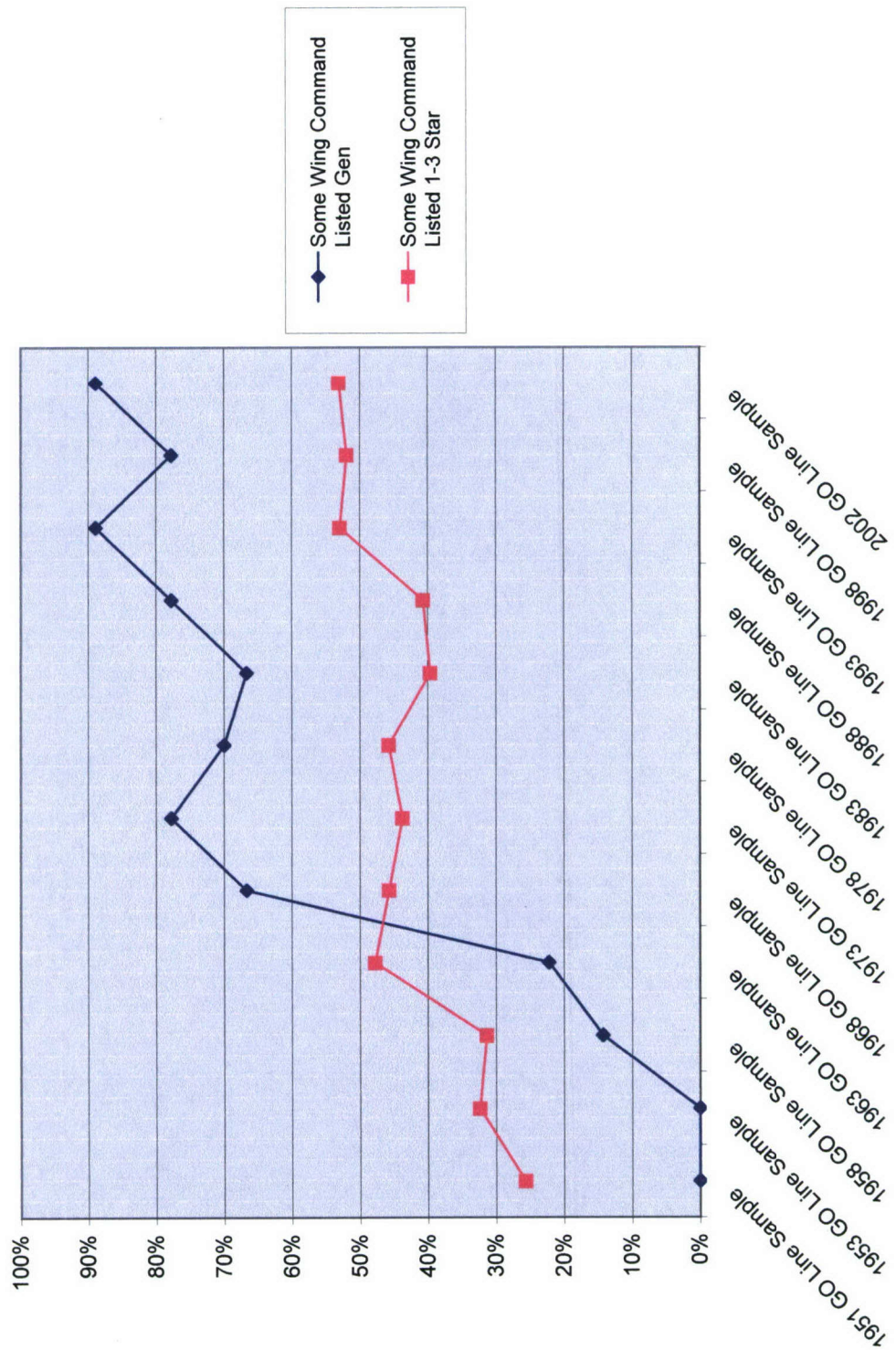
In terms of differences between 4-star and 1-3 star general officers with respect to wing command, Chart 9-13 (GO Samples: General versus 1-3 Star General Officers – Some Wing Command) indicates that once the rapid promotion effect of World War II diminished, a greater emphasis is placed on wing command at the 4-star level than at

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<sup>302</sup> However, since the data is only for an officer’s first wing command, some officers may have commanded a second, or even third, time at the wing level, and a later wing command may have been over a flying wing.



Chart 9-13: GO Samples: General versus 1-3 Star General Officers -- Some Wing Command



the 1-3 star general officer level. In the 1968 sample, 67% of the line 4-star general officers sampled reported some type of wing command. This percentage never goes lower in the successive samples, and approaches 90% at times, whereas at the 1-3 star general officer level, the percentage does not exceed 50% until the 1993 sample and then remains at the 52% to 53% range. On one hand, the 4-star general officers appear to be more heroic warrior oriented since none ever reported being commander of a center, non-flying maintenance/support wing, non-flying training wing, or non-flying other wing. Only one, in the 2002 sample, reported a first or only command over a non-flying operations wing. The percentage of 4-star general officers with bomber wing command approached 45% in the 1968 and 1973 samples, which grossly exceeded the 1-3 star general officer percentages of 20% and 10% respectively, but no 4-star generals reported bomber wing command as their first or only wing command after the 1983 sample. See Chart 9-14 (GO Samples: General versus 1-3 Star General Officers – Wing Command – Bomber). The line 4-star general officers sampled also reported fighter wing commands at higher percentages than the 1-3 star general officers from the 1973 through 2002 samples, the big differences occur in the 1988, 1993 and 1998 samples where the 4-star percentages are roughly 55%, 45%, and 45% respectively and the 1-3 star general officer percentages are on either side of 20%. See Chart 9-15 (GO Samples: General versus 1-3 Star General Officers – Wing Command – Fighter). In the 2002 sample the difference drops to 4% as the percentage of line 4-star generals reporting their first or only wing command as a fighter wing drops to 22%. However, it



Chart 9-14: GO Samples: General versus 1-3 Star General Officers -- Wing Command --  
Bomber

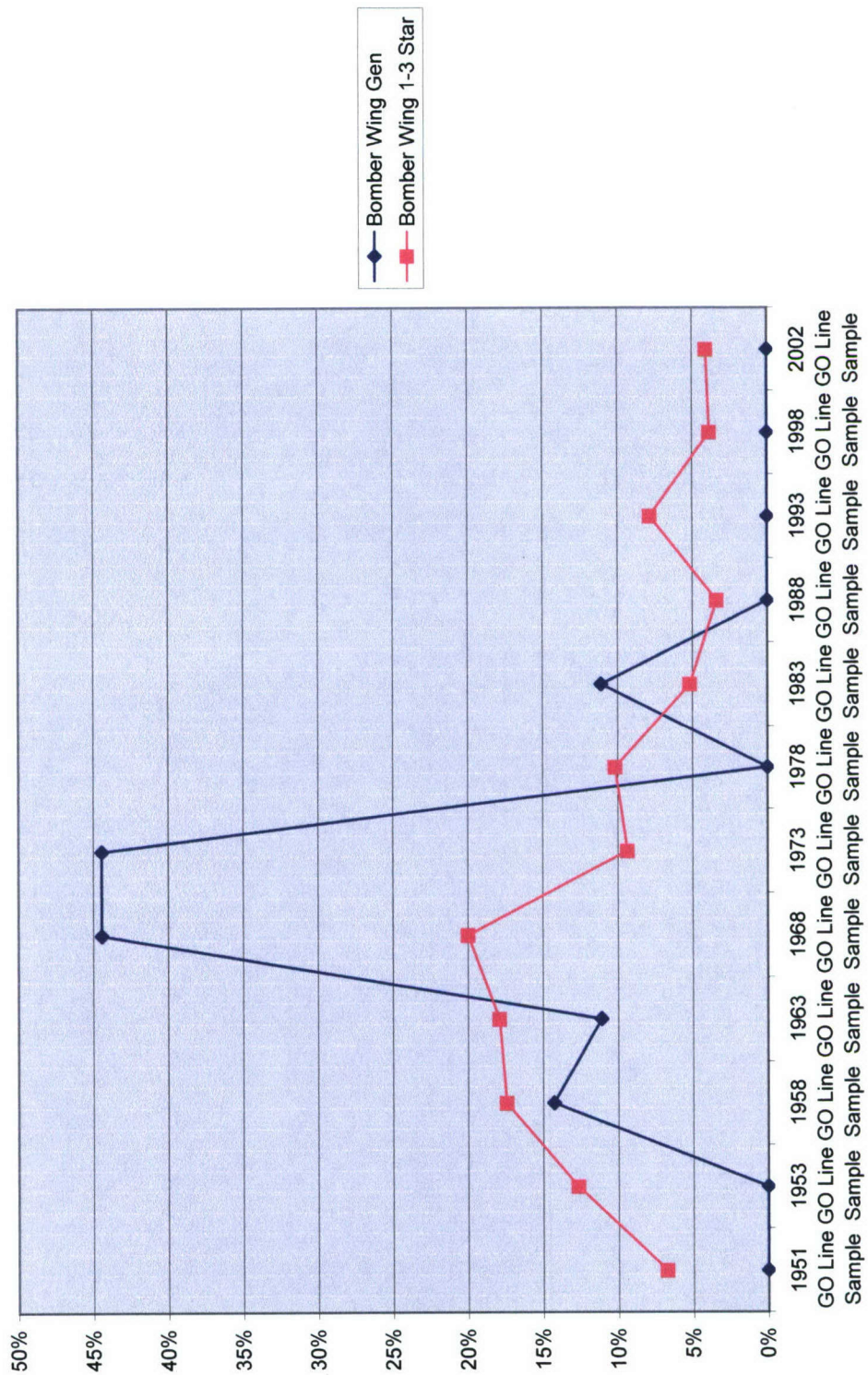
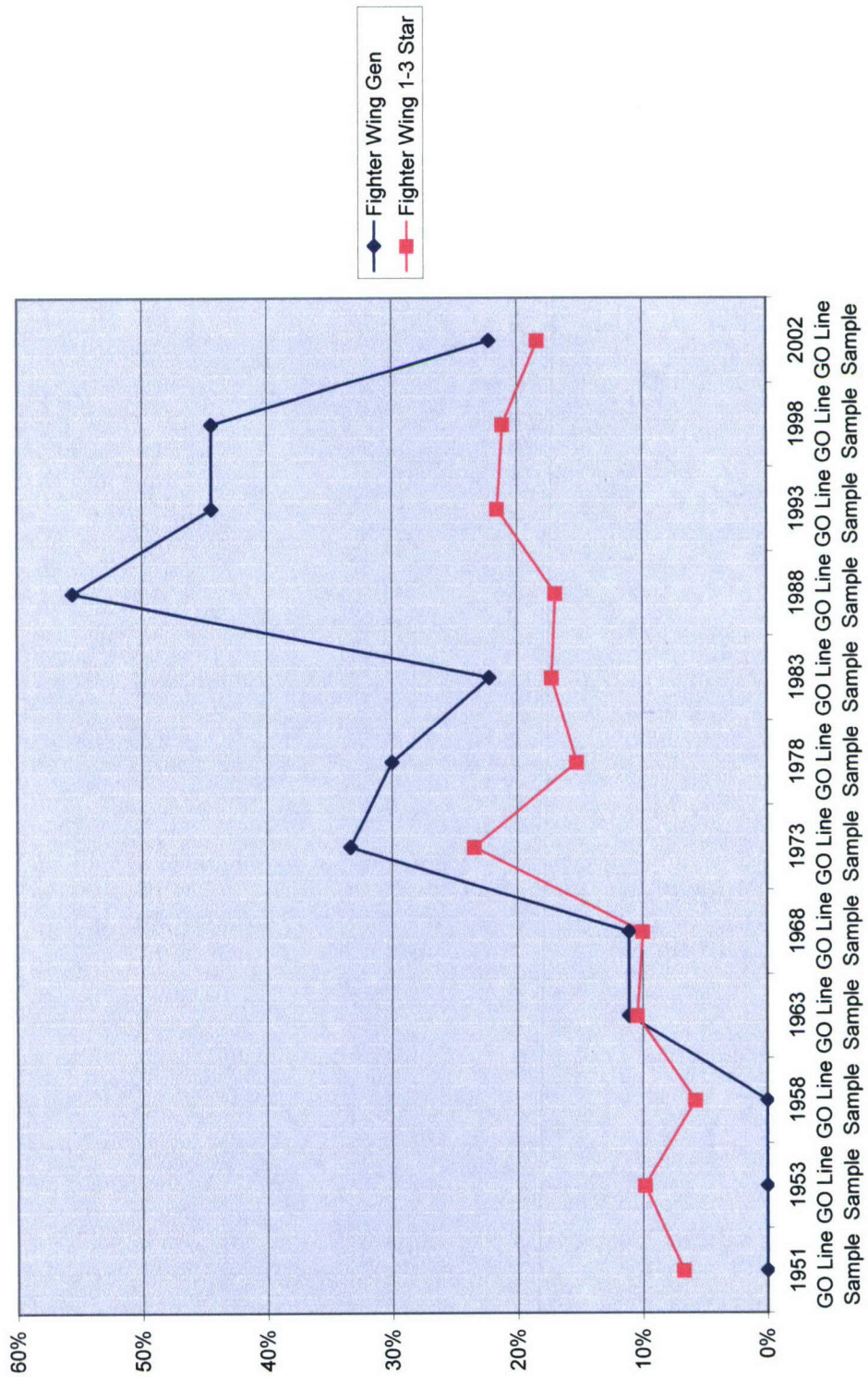


Chart 9-15: GO Samples: General versus 1-3 Star General Officers -- Wing Command --  
Fighter





is the late acceptance (only reported in the 1993, 1998 and 2002 samples) of officers whose first or only wing command was a flying training wing into 4-star general officer ranks, and an increased percentage of 4-star generals reporting flying other (tankers, airlift, surveillance and reconnaissance, etc.) wings that account for the overall big difference between the percentages of 4-star and 1-3 star general officers with wing command experience. See Charts 9-16 (GO Samples: General versus 1-3 Star General Officers – Wing Command – Flying Training) and 9-17 (GO Samples: General versus 1-3 Star General Officers – Wing Command – Flying Other). These non-bomber and non-fighter wings, as well as 4-star reports of colonel-level command as program directors or directors of a program office in the 1988, 1993 and 2002 samples indicate a potentially more visionary approach to wing level command. See Chart 9-18 (GO Samples: General versus 1-3 Star General Officers – Program Director/Director Program Office “Command” as Colonel).

The percentages of line general officers reporting squadron command across the samples can be described as a sinusoidal pattern with an overall upward slope. See Chart 9-19 (GO Samples: Total Line General Officer First Squadron Command by Percent). The initial decrease in reported squadron commands is explained by the fact that many of the officers quickly promoted to general officer in World War II had been squadron commanders, but then skipped group and wing command. More junior officers had not yet been squadron commanders and were skipped over the squadron level to group or wing commands. They were followed by the World War II wave of

Chart 9-16: GO Samples: General versus 1-3 Star General Officers -- Wing Command -- Flying Training

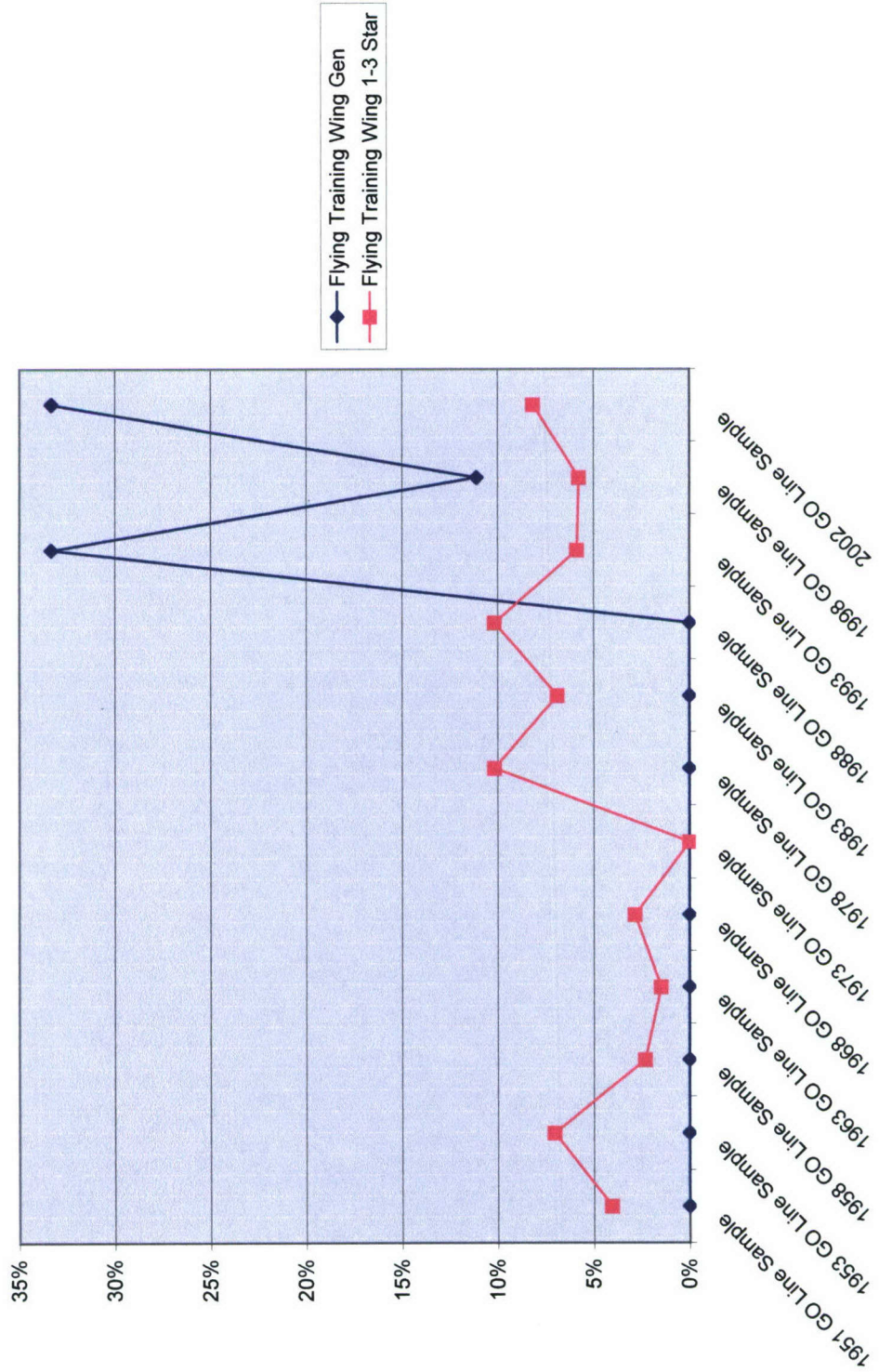




Chart 9-17: GO Samples: General versus 1-3 Star General Officers -- Wing Command -- Flying  
Other

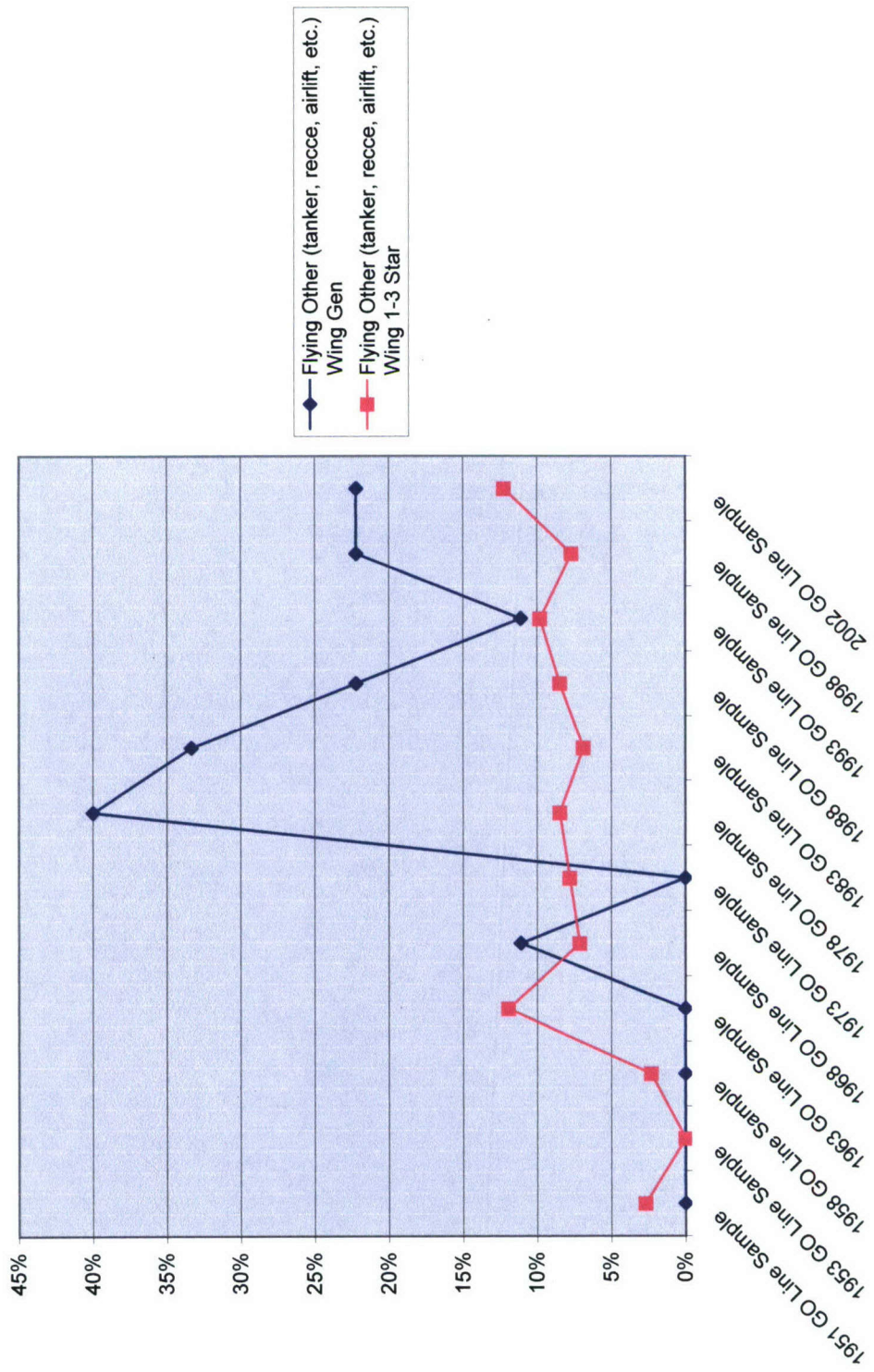


Chart 9-18: GO Samples: General versus 1-3 Star General Officers -- Program  
 Director/Director Program Office "Command" as Colonel

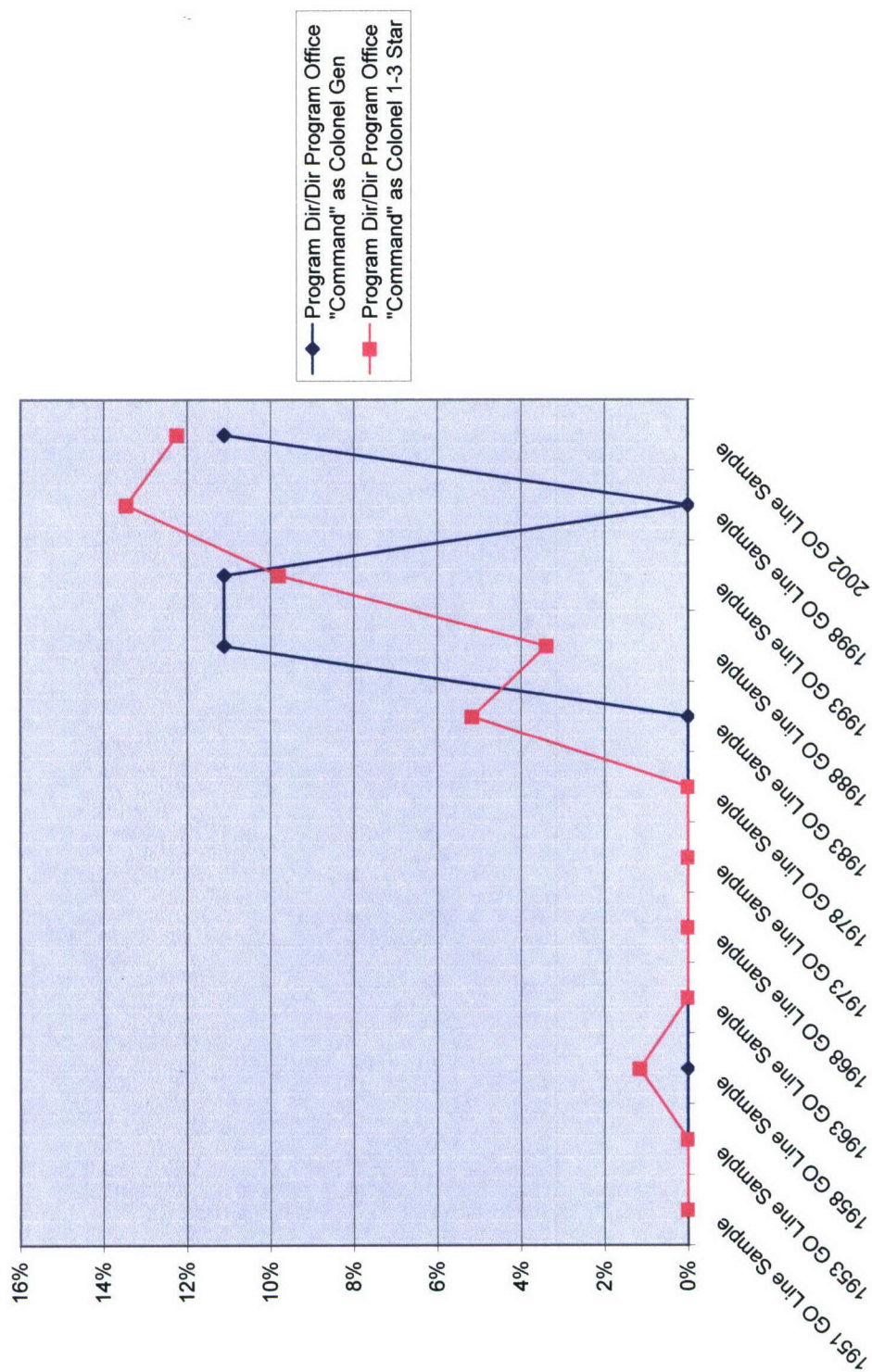
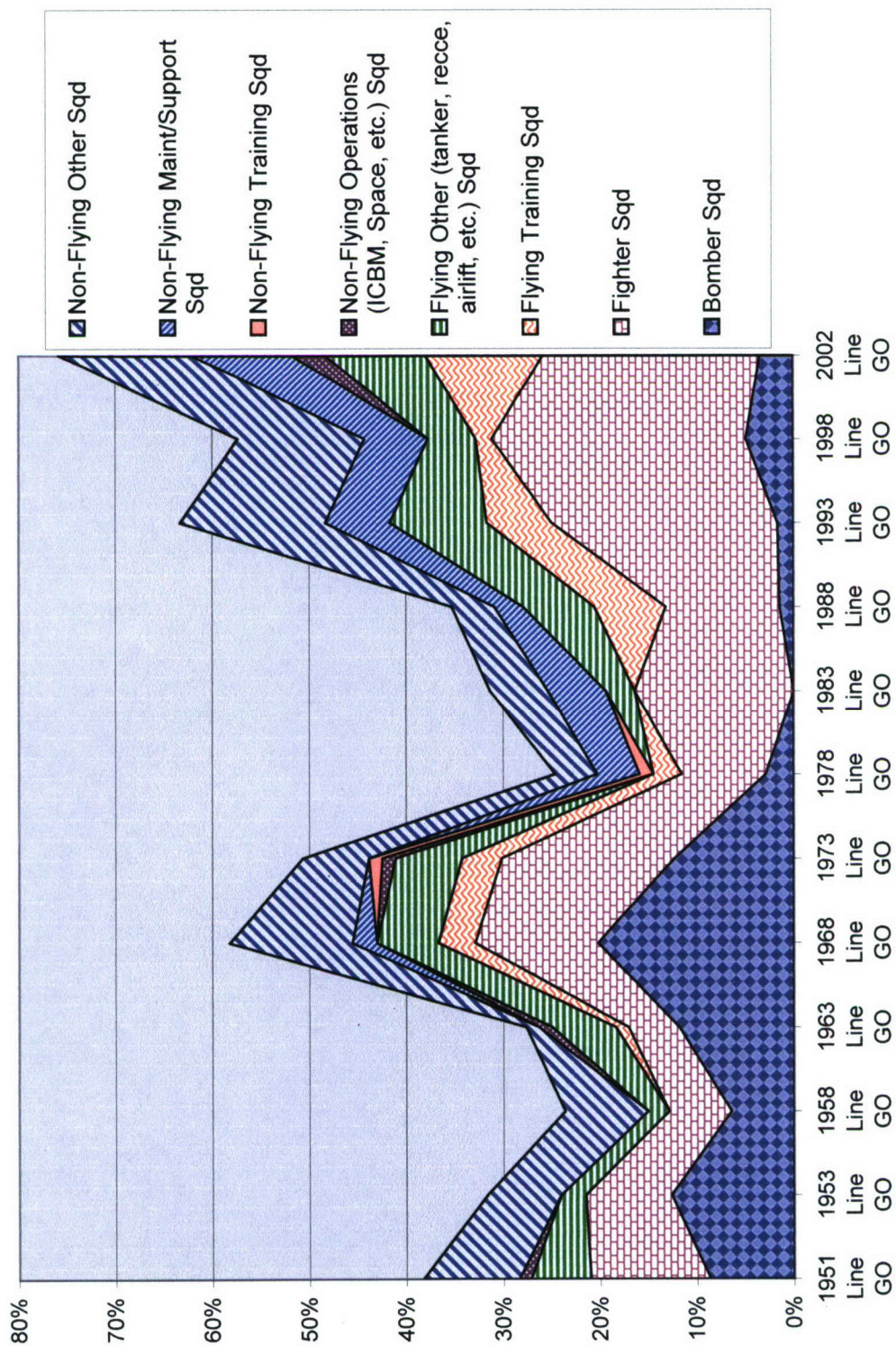




Chart 9-19: GO Samples: Total Line General Officer First Squadron Command by Percent



aviation cadets who followed the more normal progression of promotions and command. The general climb in the percentage of general officers reporting a squadron command from 25% in the 1978 sample to 76% in the 2002 sample is marked by a dramatic decrease in the percentage of generals with bomber squadron command, an increase in the reporting of fighter squadron command that exceeds the earlier bomber peak, and an increase in the percentage of officers reporting initial squadron commands over non-flying squadrons. In the 2002 sample, for example, 27% of the line general officers reported their first or only squadron command was over a non-flying unit. This indicates not only that squadron command in general was becoming accepted as prerequisite for promotions to general officer ranks, but that up-and-coming rated officers were willing to command non-flying squadrons. That in turn, indicates a shift towards the visionary warrior archetype.

#### Professional Military Education

The military's structured and professional military education system is unique in the world of professions. Most professions provide the specialized knowledge and professional indoctrination up front, for example in medical school, law school or a seminary. The military, however, provides initial officer training, grants an officer's commission, then sends the officer to technical training and out to the field to get some work experience at the junior officer level. Then, the junior officer is given a short infusion of professional training (currently called Squadron Officer School) theoretically to help him understand the professional aspects of his current job and his



place in the constellation of the Air Force officer corps. Then, at the rank of major, with ten or more years of commissioned time, the officer gets a second round of professional training at command and staff college. This prepares the officer for field grade officer responsibilities in staffs and command. After several more years of service and promotion to lieutenant colonel or colonel ranks, the officer is sent to war college, which ostensibly prepares the officer for duty at the colonel and general level. Since the officer has already been trained for command and staff work and has probably served at least one tour on a staff, and maybe as a commander, the war college education is designed to implant the officer with broad, strategic and visionary perspectives on the officer corps, its jurisdictions, its interactions and place in society, and its future possibilities.

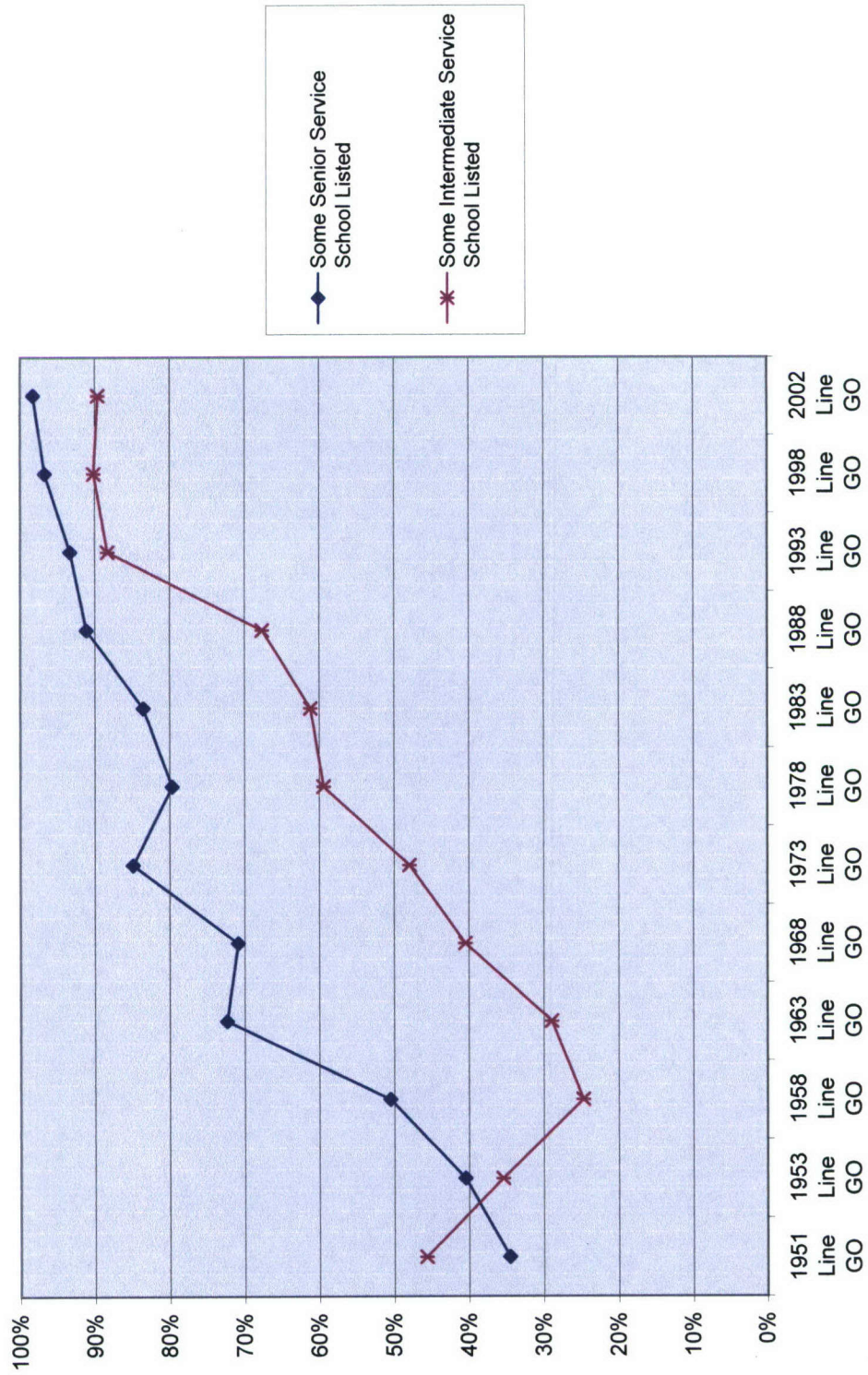
Professional military education is successive and tied to rank, which makes it clear that the officer corps and the profession itself is hierarchical. Symbolically that has traditionally been portrayed with the image of junior officers at the bottom and senior officers at the top of the pyramid. However, in a world of competing professions, a sphere with junior officers at the periphery and senior officers at the core might offer a better image. The general officers at the core are deemed to have a higher degree of professional competence than those on the periphery. They have presumably received the appropriate professional military education at each step along the way, and that education, coupled with the experiences gathered over the course of their career results in them ending up with the desired broad, strategic and visionary perspective

before being promoted to 4-star rank. This theoretical construct contains several implications. The first is that officers below the rank of colonel are not expected to be visionary. Their breadth of their experience may be limited, and they certainly have not received the final war college level of education. Colonels and 1-3 star generals are developing into visionaries, and there is enough slack in the model that many may never truly develop the prerequisite perspective for promotion to 4-star rank. The 4-star general officer rank forms the innermost core of the profession, and should therefore possess the vision to lead the profession in the present while preparing it for the future. Another major implication is that the profession requires officers to start on the periphery and move towards the core. There may be ways to speed the passage, but it cannot be skipped because it is the combination of work experience and step-wise professional education that prepares an officer to serve in the core. In addition, the work and professional education prepare a broad pool to support the core since most will not make it to the very center point of the sphere.

Consequently, Chart 9-20 (GO Samples: Total Line General Officer Senior Service Versus Intermediate Service School Credit by Percent) shows no surprises. The war college, or senior service school, level is the most critical stage of professional military education for general officers, and the trend is clearly headed in the direction that senior service school be almost a prerequisite for general officer rank. The curve for the percentage of line general officers with reference to some type of intermediate



Chart 9-20: GO Samples: Total Line General Officer Senior Service School Versus Intermediate Service School Credit by Percent

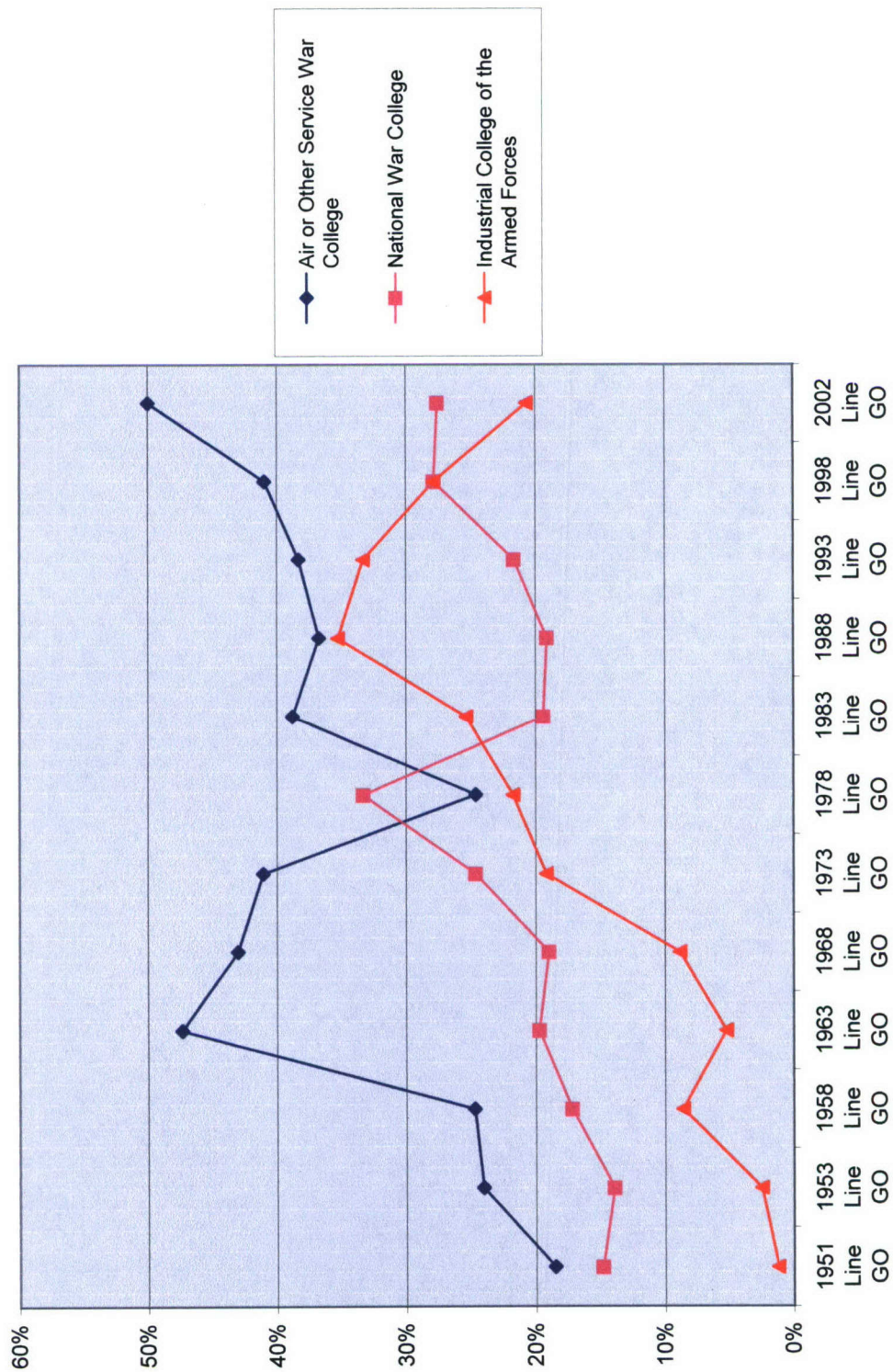


service school (command and staff) in their biographies is moving in the same direction since the 1958 sample. The initial drop in the percentage of line general officers with intermediate service school level professional education is another result of World War II. When the war started, there was naturally a bigger pool of officers with intermediate service school under their belts. The initial rapid promotions elevated these officers to general officer without war college attendance. More junior officers, who had not attended intermediate service school before the war were also quickly promoted, but they were often sent to senior service school after the war, but not all the way back down to command and staff college.

Chart 9-21 (GO Samples: Total Line General Officer Senior Service School Credit by Percent) provides an interesting qualitative look at the percentages of officers who attended the various senior service school options. The chart is based on the individual officer's first or only senior service school and includes in-residence and correspondence-type attendance. Only the Air War College and other service war colleges traditionally have offered correspondence-type attendance. Since the Air Force officer corps controls and funds the Air War College, one would expect the majority of Air Force senior service school attendees in any given year to attend the Air War College in-residence and correspondence courses, which is largely reflected in the chart. However, the trend in the percentage of line general officers attending a joint school, i.e., either the National War College (NWC) or the Industrial College of the Armed Forces (ICAF), is clearly increasing, to the point that it reaches 49% in the 2002 sample.



Chart 9-21: GO Samples: Total Line General Officer Senior Service School Credit by Percent



In addition, the interplay between the percentages of officers who attended NWC and ICAF is interesting from the standpoint that NWC is traditionally viewed as the warrior's course, while ICAF is thought to be for support officers. In practice, there is a mix of officers with operations-type specialties and support-type specialties in both colleges, but the curriculum, staff, and student base at ICAF does lean more towards acquisitions and materiel. Consequently, the lower levels of ICAF graduates from the 1951 through 1978 samples indicates both lower levels of non-rated, i.e., support, officers in the general officer corps as well as a lower status for this type of work in the general officers corps. The increased percentage of ICAF graduates above NWC graduates from the 1983 through the 1993 samples parallels the Air Force officer corps emphasis on acquisitions in the 1980s, with perhaps a concurrent sending of more pilots to ICAF.

With respect to differences between 4-star and 1-3 star general officers concerning professional military education, Chart 9-22 (GO Samples: General versus 1-3 Star General Officers – Some Intermediate Service School) shows that intermediate service school attendance for 4-star general officers was initially dramatically affected by the World War II promotions. However, this seemed to drift into a general lower emphasis on intermediate service school attendance for 4-star than for 1-3 star general officers since the percentage of 4-star general officers with intermediate service school only exceeds the 1-3 star percentage in the 1983 and 1998 samples. Chart 9-23 (GO Samples: General versus 1-3 Star General Officers – Some Senior Service School)



Chart 9-22: GO Samples: General versus 1-3 Star General Officers -- Some Intermediate Service School

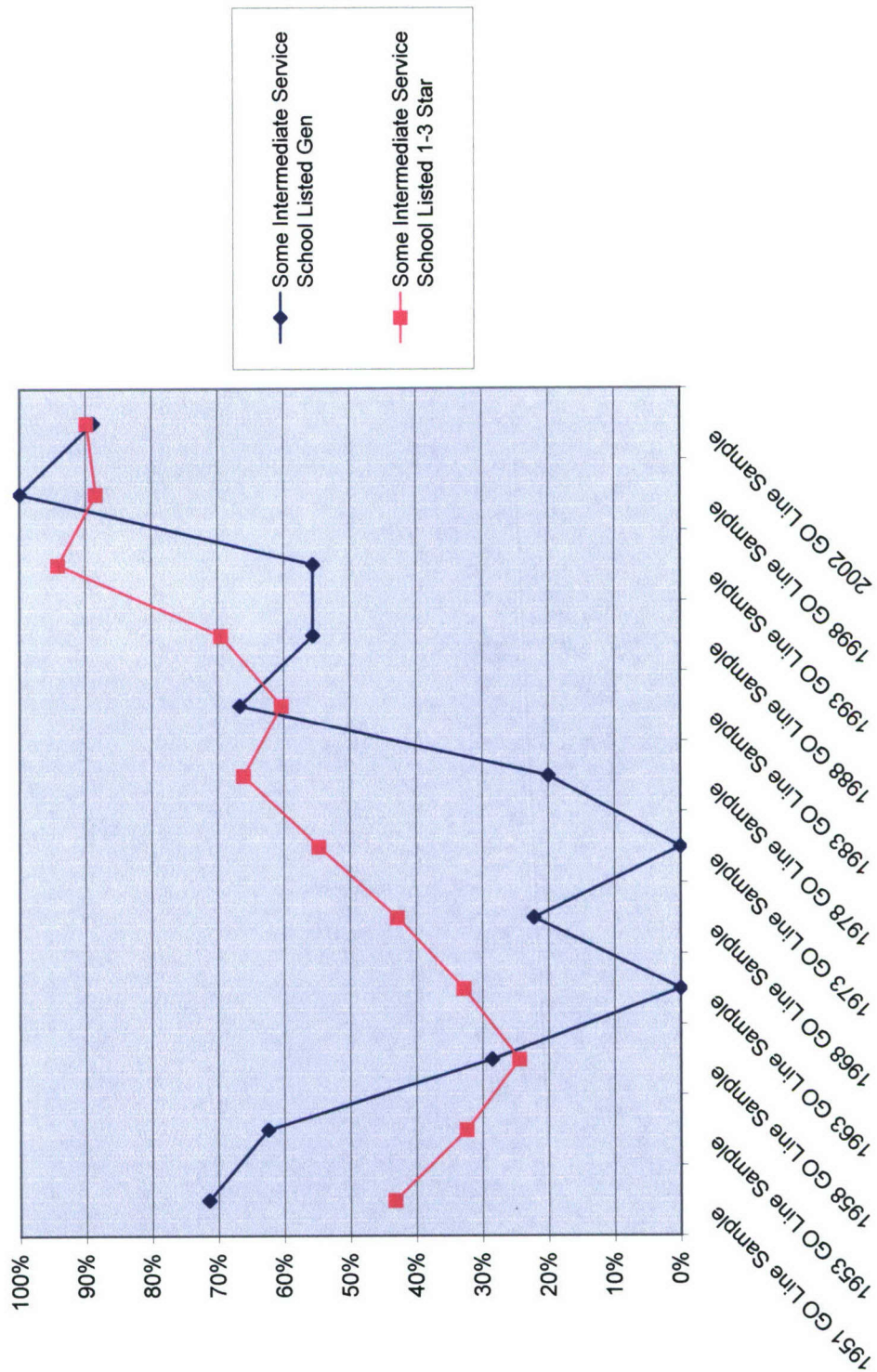
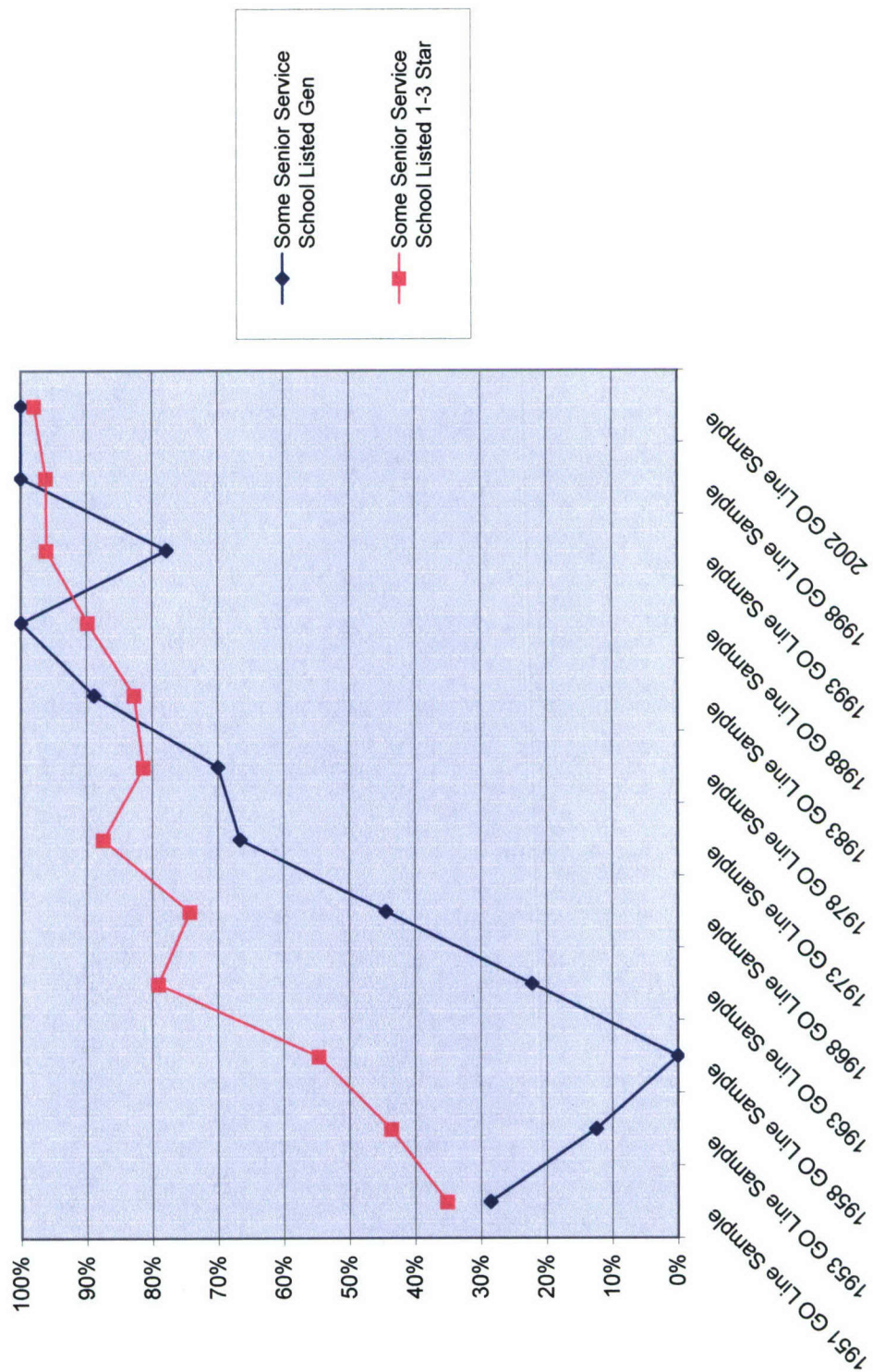


Chart 9-23: GO Samples: General versus 1-3 Star General Officers -- Some Senior Service School





shows a somewhat different story for senior service school attendance. Although the World War II promotion factor is still evident, 4-star senior service attendance hits its nadir earlier (in the 1963 sample), and starts an immediate climb in the 1963 sample, with over half of the 4-star general officers sampled attending senior service school by the 1973 sample. The percentage of 4-star general officers with senior service school attendance exceeded the 1-3 star general officer level by the 1983 sample, and was at 100% in the 1988, 1998 and 2002 samples. Senior service school is more highly valued in the 4-star general officer ranks. In terms of the ICAF versus NWC debate, 1973 was the first sample reporting any 4-star ICAF graduates, and the percentage of 4-star ICAF graduates was 44%, which greatly exceeded the 1-3 star rate of approximately 15%. See Chart 9-24 (GO Samples: General versus 1-3 Star General Officers – Senior Service School – Industrial College of the Armed Forces (ICAF)). However, the percentage of 4-star general officers sampled that are ICAF graduates dropped into the 10% to 22% range, well below the 1-3 star percentages in the 1978 through 1998 samples, and there were no 4-star general officer ICAF graduates in the 2002 sample. Conversely, the first 4-star general officer graduate of NWC appeared in the 1963 sample, and although the curve is erratic, 44% or more of the 4-star general officer sampled were NWC graduates in the 1978, 1988, 1993 and 2002 samples. See Chart 9-25 (GO Samples: General versus 1-3 Star General Officers – Senior Service School – National War College (NWC)). Overall, this indicates a higher status for warriors than materiel support functions among 4-star general officers.

Chart 9-24: GO Samples: General versus 1-3 Star General Officers -- Senior Service School --  
Industrial College of the Armed Forces (ICAF)

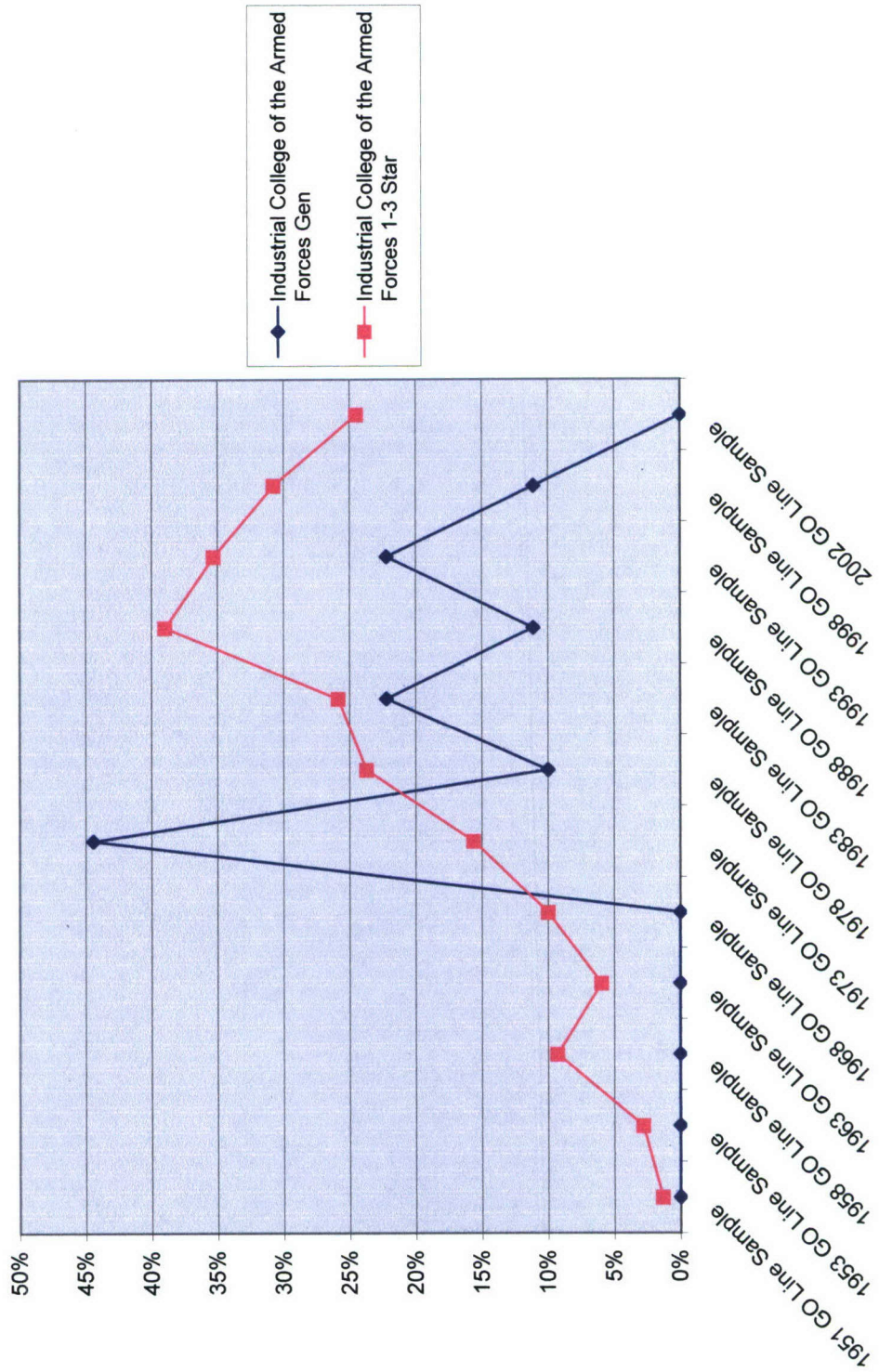
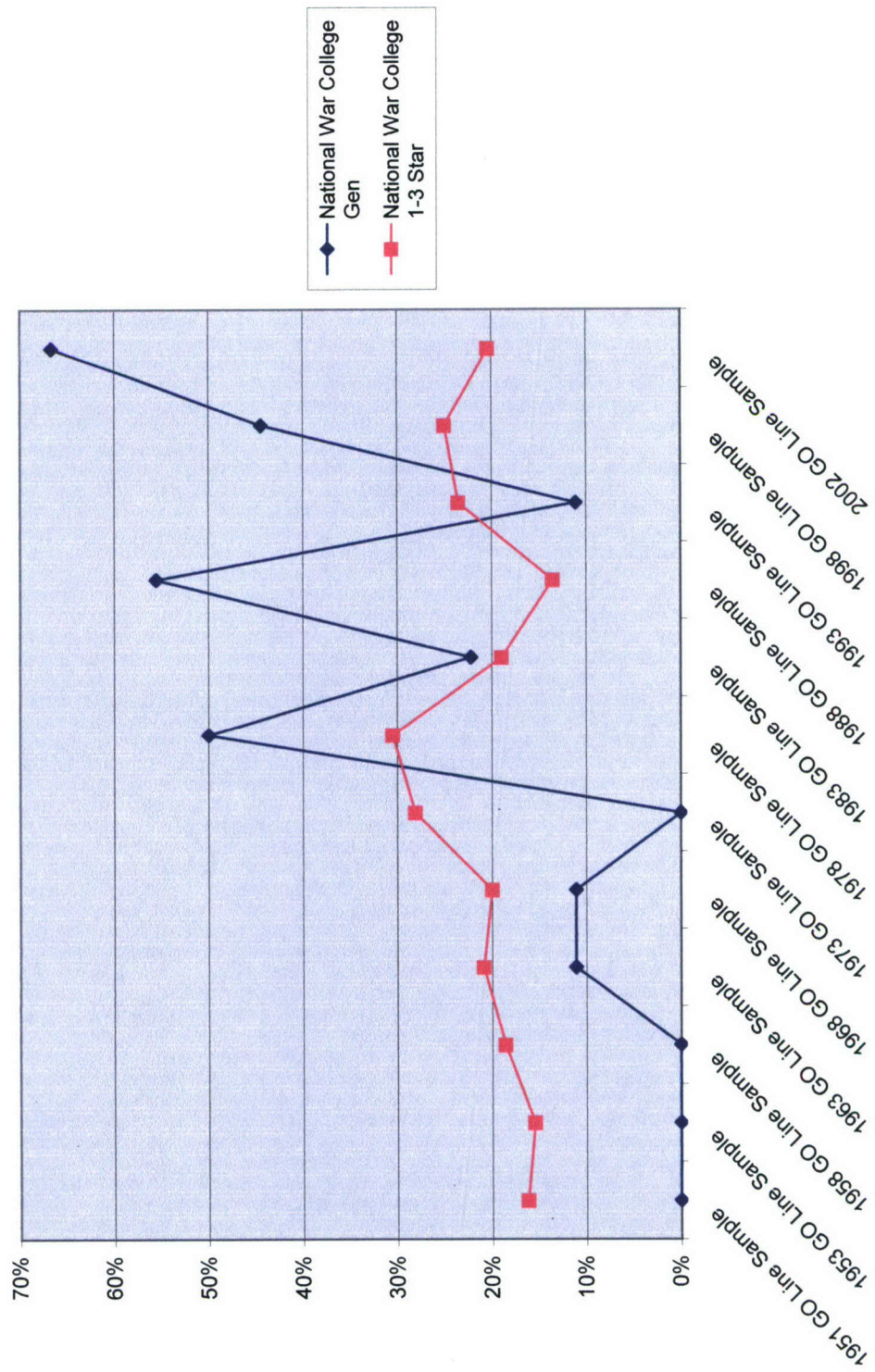




Chart 9-25: GO Samples: General versus 1-3 Star General Officers -- Senior Service School --  
National War College (NWC)



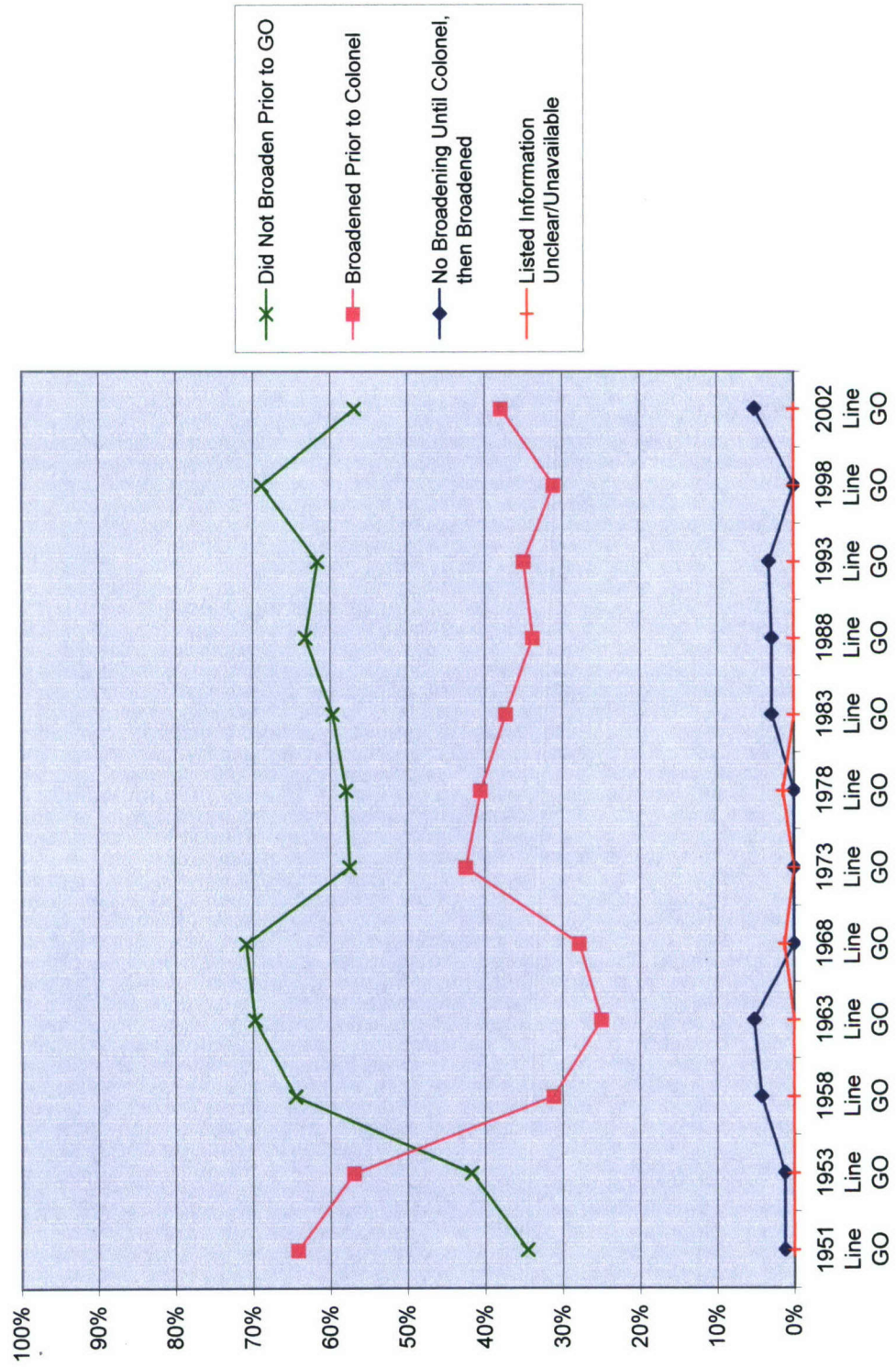
### Career Broadening

One might expect that officers selected for general officer rank in the Air Force might have broader than normal career paths. If the profession is truly looking to develop visionary leaders, an officer who has served a tour outside of his technical specialty would seem to have a broader perspective of what the Air Force is and what it might be capable of doing in the future. Chart 9-26 (GO Samples: Total Line General Officer Colonel Broadening by Percent) indicates that historically the vast majority of line general officers sampled did not serve career broadening tours until reaching the rank of general officer. Under half of the general officers historically served in a broadening tour prior to the rank of colonel, and few general officers reported career broadening tours in the rank of colonel. The initial decrease in the percentage of officers who served a career broadening tour prior to the rank of colonel from the 1951 through the 1963 samples is partly a result of the quick promotions and limited opportunities to career broaden during WWII. This was followed by a return to more normal career patterns, in which the overall tendency from the 1973 to the 1998 sample is one of shrinking percentages of general officers with broadening tours prior to the reaching general officer rank. The 2002 sample appears to show a reversal of the trend, but further sampling would be required to tell if the 2002 data is an anomaly or the start of a new trend.

The initially high percentages of line general officers in the 1951 and 1953 samples who career broadened prior to the rank of colonel is also caused by the fact that



Chart 9-26: GO Samples: Total Line General Officer Colonel Broadening by Percent

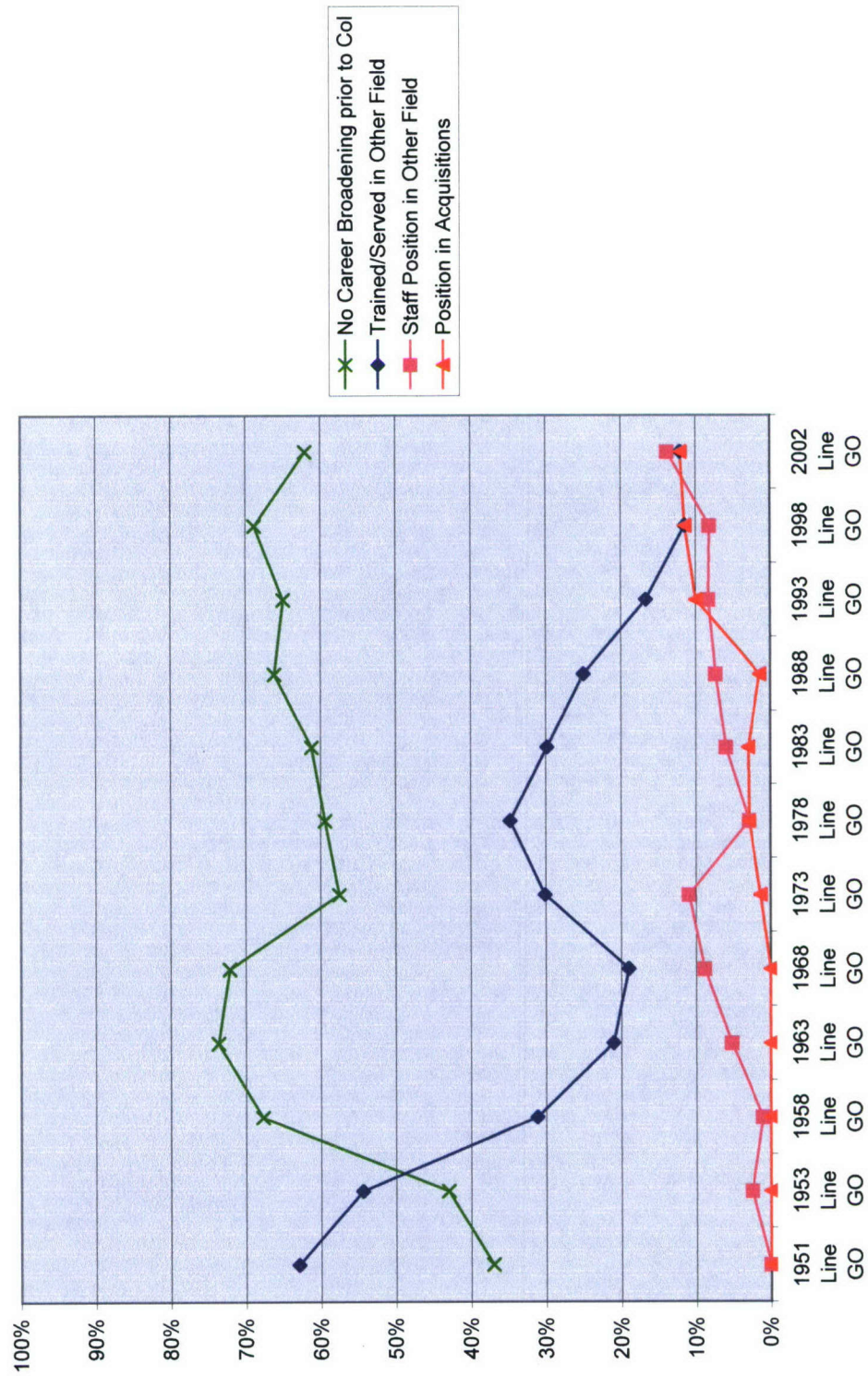


most of these fell under the category of having trained and/or served in another career field. See Chart 9-27 (GO Samples: Total Line General Officer Career Broadening Prior to Colonel by Percent). This category encompasses the many pre-World War II West Point graduates and other Army officers who were originally commissioned in other branches of the Army and did not initially report to the Air Corps for pilot training. Consequently, as the Army began to send more officers directly to the Air Corps upon commissioning, this source of career broadening dried up. As this occurred and the effect of the World War II promotions tapered down, the transition to the gated flight pay system in the 1970s meant that career broadening jobs no longer permitted a pilot to fly for currency and flight pay as part of the job, which may have contributed to the general decrease in the percentage of line general officers who served in career broadening tours.

Furthermore, the type of career broadening prior to colonel shifted away from serving in other operational, maintenance or support line-type jobs, which often required training before assuming the position, to general staff or acquisitions positions outside of the officer's main career track. Staff and acquisitions positions did not typically require prior training or experience so officers could be rotated in and out of such billets without affecting training pipelines. Consequently, by the 1998 and 2002 samples, approximately two-thirds of the line general officers sampled did not career broaden prior to reaching the rank of colonel, and the third that did consisted of roughly equal percentages of officers who were trained/served in another field, who served in a



Chart 9-27: GO Samples: Total Line General Officer Career Broadening Prior to Colonel by Percent



staff position in another field, or who had served in acquisitions without that being their prime specialty.

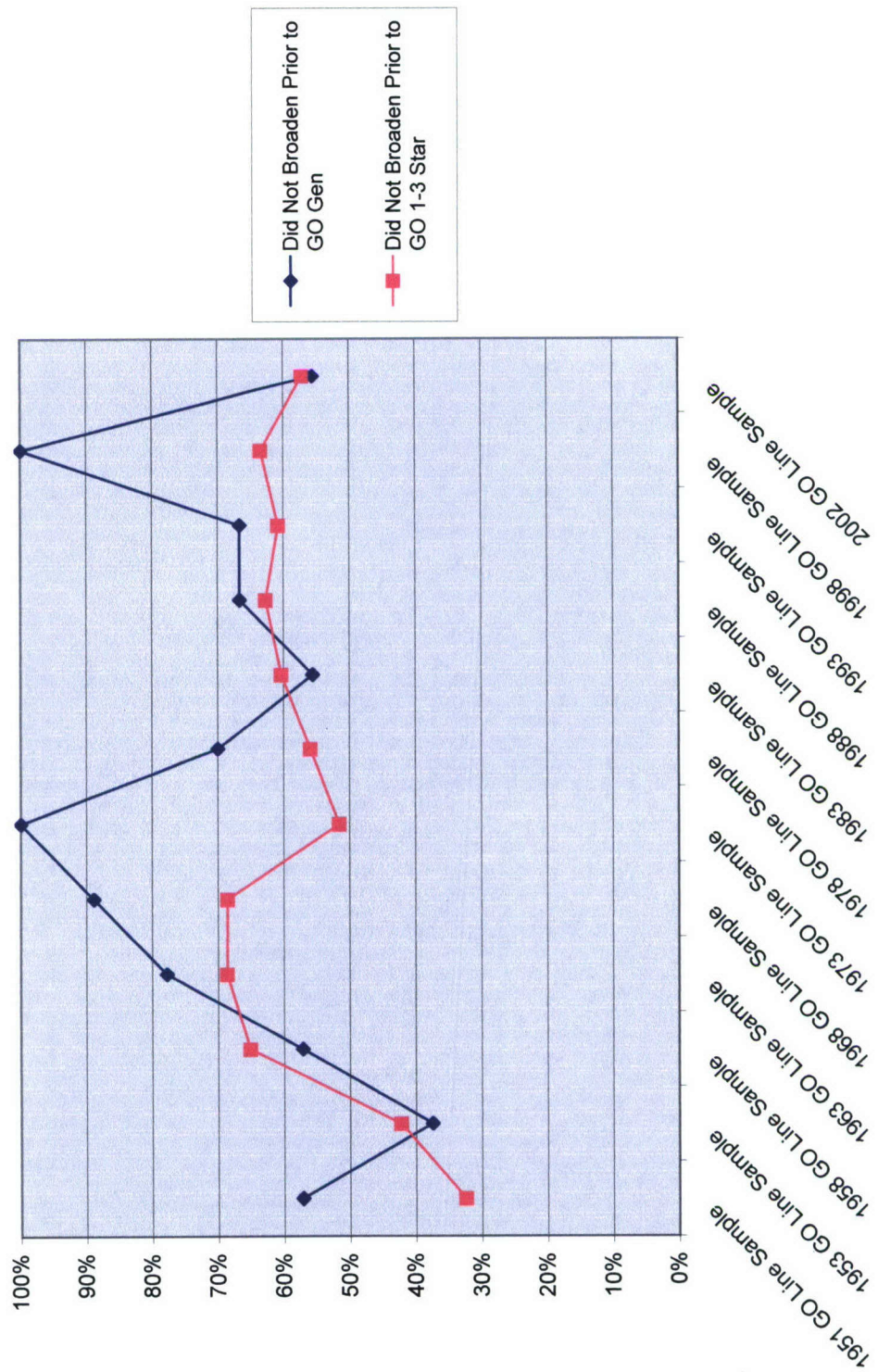
Since the rate of officers who career broaden at the rank of colonel is historically in the 5% or less range, the overall indication is one of a stove-piping of officer development. This in turn implies a narrowing experience basis within the general officer corps over the course of the samples from 1951 through 2002. It also implies a preference within the general officer corps to cover the gamut of general officer billets with either specialists, whether pilots or maintenance officers, or officers with very shallow, high-level broadening. This trend has been amplified at times in the 4-star general officer level, but never contradicted. Chart 9-28 (GO Samples: General versus 1-3 Star General Officers – Colonel Broadening –No Broadening Prior to General Officer) shows that the percentage of 4-star general officers who did not serve in a career broadening tour prior to general officer rank exceeds the percentage for 1-3 star general officers by 14% or more in the 1951, 1968, 1973, 1978, and 1998 samples. In fact, in the 1973 and 1998 samples, 100% of the 4-star general officers sampled did not report career broadening tours in their biographies. In the rest of the samples, the values for 4-star and 1-3 star general officers are relatively close.

#### Exotic Characteristics

The exotic characteristics variable is somewhat similar to the career broadening variable. It concerns duty tours that may have expanded an officer's horizons and perhaps given the officer a more visionary perspective on the Air Force officer corps'



Chart 9-28: GO Samples: General versus 1-3 Star General Officers -- Colonel Broadening --  
No Broadening Prior to General Officer



expertise, jurisdictions, and membership. Janowitz proposed that the most senior general officers who are at the core of the officer corps may be more visionary than their lower ranking contemporaries. If a line officer is too visionary or drifts too much from accepted career paths, he will not be promoted to general officer ranks. However, if an officer follows the accepted career path without deviation, he may become a general officer but he will not be considered for promotion to the 4-star rank since at that level a sense of vision, openness to new ideas, and ability to see beyond the military pale is critical for the survival and growth of the officer corps. The exotic characteristics variable includes duty in legislative liaison, exchange tours, *nearness to the flag pole* in some capacity such as an aide, and whether an officer reports participation in the planning of a major air campaign.<sup>303</sup> In addition, the variable includes whether the officer has served on the faculty or staff of an officer training institution like the academy or ROTC or at a professional military education institution like Air Command and Staff College. This is included because Huntington includes the responsibility to educate and train one's own members in the profession's expertise as a defining factor in determining whether an occupation is a profession.

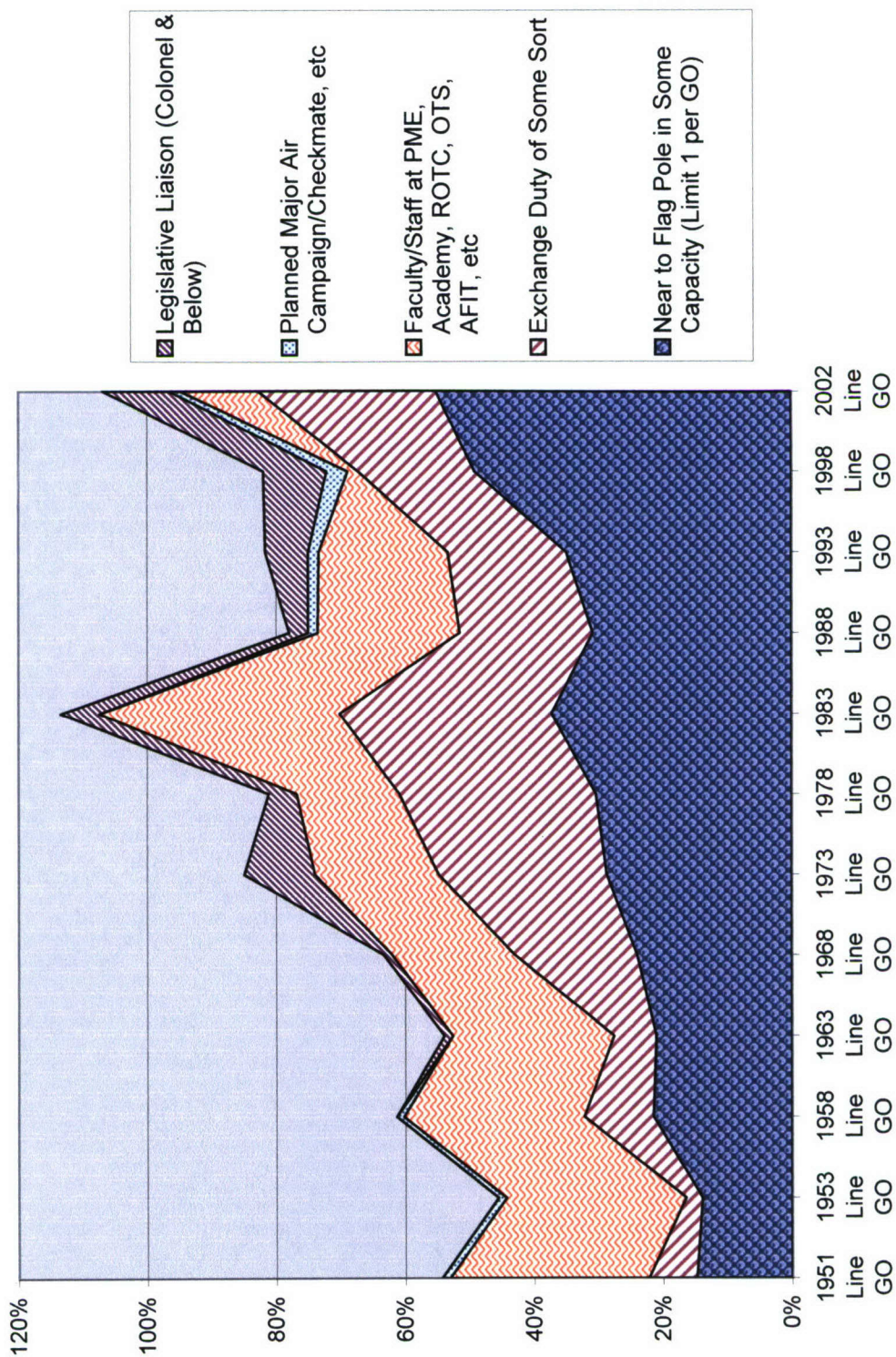
Chart 9-29 (GO Sample: Total Line General Officer Exotic Characteristics Summary by Percent) presents a qualitative and quantitative look at the exotic characteristics variable. The 1983 and 2002 samples exceed 100% because the sub

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<sup>303</sup> Nearness to the flag pole consists of the sub categories of duty as an aide/military assistant, participation in the Air Staff Training Program (ASTRA), participation in a special staff group, reporting that one's father was a colonel, reporting that one's father was a general officer, or an obvious and very public father-son general officer link.



**Chart 9-29: GO Sample: Total Line General Officer Exotic Characteristics Summary by Percent**



characteristics are not mutually exclusive, although only the first tour is counted in the case of multiple tours in a particular sub category by one officer. For example, a few general officers seemed to make a career out of being an aide, but they are only counted once as serving near the flag pole. Although some officers clearly served in different sub characteristics in different duty tours, this appears to be self-limiting in most cases. An officer might be able to combine nearness to the flag pole with another sub characteristic, but combining two of the other sub characteristics would make an officer particularly exotic and also take him out of the mainstream officer corps and flying for an unusual amount of time.

The chart shows that the nearness to the flag pole is the most pronounced sub characteristic over the course of the samples. Although only 15% of the line general officers sampled in 1951 indicated a tour or relationship within this sub category, the percentage increases relatively steadily through the 2002 sample when it encompasses 55% of the line general officers sampled. The nearness to the flag pole variable is an interesting phenomenon since neither heroic warriors nor visionaries want to be portrayed as boot-lickers. Representatives of the archetypes want to be accepted into the inner circle of the senior leadership because of their glorious reputation or because of the validity and persuasion of their argument. However, it is not clear if general officers select junior officers to be their aides because of either. General officers may in fact select junior officers using other criteria and then expose them to the concepts of glory or vision, or put them in a place to gain glory or vision.



Janowitz points out that the unprecedented mobility afforded Air Force officers provides opportunities to influence the assignments process in ways that are quite different than in the other services.<sup>304</sup> In the Air Force a mentor can send his aide candidate on a cross-country flight to meet his prospective new boss, or the general officer seeking a new aide might fly out to meet the perspective aide. In addition, if they are both fliers, the interview can take place in the cockpit during a flight. In this case, flying proficiency and the perfect comment on the general's landing might play more of a role in the selection than any other potential factors. It also meant, at least historically, that pilots would have an inside track to becoming aides. This also increased the potential for the development of an inner circle based on cronyism that would also perpetuate the racial, ethnic, gender and rated characteristics of the general officer world. On the other hand, general officers could also use the aide system as a way to fast track non-white, non-rated, and/or female officers who might otherwise have great difficulty breaking through glass ceilings. The relatively straight-line, steadily increasing nature of the nearness to the flag pole sub characteristic implies that this type of duty is no longer just something that many officers simply do, but that it is becoming something that an officer should or must do if he hopes to attain general officer rank. Furthermore, the percentage of general officers who reported participation in the Air Staff Training Program (ASTRA) while company grade officers climbed

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<sup>304</sup> Janowitz 148.

from 0% in the 1988 sample to 16% in the 2002 sample.<sup>305</sup> This indicates a conscious, institutionalized effort to pre-select and groom officers for general officer rank. None of this is particularly positive from a professional standpoint. Aside from the potential for cronyism, the fact that over half of the line general officer corps has served in such positions indicates a tendency to downplay professional competence while increasing the importance of political acumen as a key to success in a military career.

Furthermore, the use of junior officers in the ASTRA and now the Air Force Intern Program indicates that extensive professional experience is not really critical to performing many staff jobs. And that reflects back to the Air Force officer corps' traditional penchant and ability to keep a rated reserve force in staff jobs in the active Air Force.

Tours in legislative liaison offer junior and middle grade officers unprecedented exposure to the highest ranks of the Air Force and their relationships with Congress. However, this is a contentious issue since such activities seem to deflect an officer's focus away from developing purely military expertise and touch upon the foundations of the military profession. It is not a heroic versus visionary warrior issue as much as one on the level of political involvement of the officer corps. Huntington's model of the military profession describes an officer corps that eschews political involvement and remains largely separate from society. From this perspective, promoting large numbers

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<sup>305</sup> ASTRA began in 1969, with 30 junior officers serving one-year tours at the headquarters level. ASTRA and the Strategic Air Command mini-ASTRA program were limited (initially at least) to rated officers. See "SAC Begins JO Staff Program," Air Force Times 27 May 1970: 2.



of officers with experience in legislative liaison to general officer rank or purposely sending fast-track officers for a tour in legislative liaison on the way to general officer rank puts the officer corps on the dangerous road to politicization. The officer corps is then perceived as politically tainted and loses its credibility since it is no longer proffering advice based solely on its purely military expertise. Instead of remaining outside of and subordinate to the political system, the officer corps then becomes an active player, lobbying for its own perceived interests, which do not necessarily coincide with those of the nation. On the other hand, if professions are in constant competition as Abbott contends, then the Air Force officer corps must remain in permanent discussion with Congress and the public in order to lobby for agreement or ratification of new and shifting Air Force officer corps' jurisdictions. This perspective requires a very politicized officer corps. In form, the Air Force officer corps advocates the Huntington position. In practice, however, Abbott's proposition cannot be ignored. Furthermore, the conflux of Air Force acquisition programs, defense contractors, lobbyists, pork-barrel spending, patriotism – in short, the military-industrial complex – appears to be a permanent fixture of the American post World War II political scene. Within the Air Force officer corps, however, no general officers reported tours in legislative liaison type jobs in the rank of colonel or below in their biographies until the 1963 sample. However, at least one general officer per sample reported a legislative liaison tour from 1963 through 2002. The percentage of general officers reporting a legislative liaison tour jumped to 11% in the 1973 sample, indicating a Vietnam effect

of increased officer involvement with Congress, then generally decreased to only 3% in 1988, before climbing and leveling out at 10% in the 1998 and 2002 samples. It will be interesting to see where this goes in the future.

The exchange tour sub category includes operational, support, or long professional military courses like command and staff or war college with foreign militaries. The sub category also includes such tours with other American military services, beginning with the 1968 line general officer sample.<sup>306</sup> The exchange tour sub category also includes duty tours in civilian settings like the State Department, Fulbright Fellowships and Olmsted Scholarships.<sup>307</sup> The exchange tours sub category does not count duty tours in the Office of the Secretary of Defense, the Joint Staff, joint combatant command staffs, or NATO staffs and commands.<sup>308</sup> Chart 9-30 (GO Samples: Total Line General Officer First Exchange by Percent) shows the breakout of the general officers' first or only exchange tour. It is clear that the highest percentage of exchange tours is with other US services. It remains the dominant type of exchange from its first reporting in the 1968 sample through the 2002 sample. It is not clear

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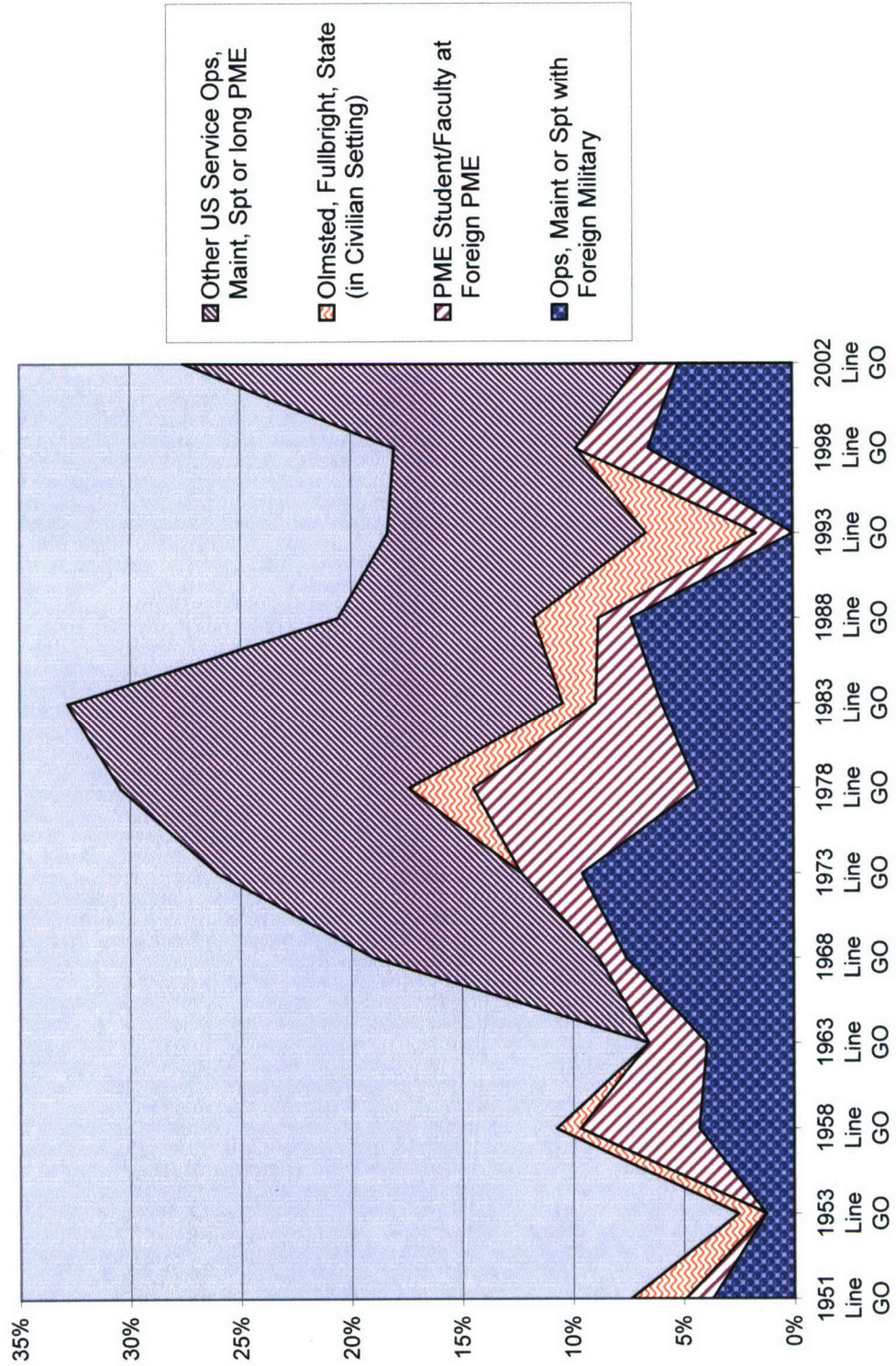
<sup>306</sup> The 1968 sample was chosen as a somewhat arbitrary cutoff point, but all "Air Force" officers who were commissioned prior to September 1947 were commissioned in the Army or Navy. Consequently, they all technically served in another service and frequently attended Army or Navy staff or war colleges because they were after all in the Army or Navy. Since it was not an exotic experience in these cases, it would be misleading to use it in this sub characteristic, and difficult to code. Some Air Force general officers still potentially fell into this category after the 1968 sample, but 1968 seemed to be a good place to strike a balance and keep the coding simple.

<sup>307</sup> The Olmsted Scholarship program sends Air Force and officers from the other services abroad to study for two-year periods at foreign universities in non-English speaking countries, where the language of instruction historically has not been English.

<sup>308</sup> The Goldwater-Nichols Act made it a requirement to serve in such a position prior to promotion to general officer ranks.



Chart 9-30: GO Samples: Total Line General Officer First Exchange  
by Percent



whether the spikes in 1983 (22%) and 2002 (21%) or the big drop in the 1988 through 1998 samples is the anomaly. However, the general officers in the 1988 (9%) through 1998 (8%) samples experienced the “hollow force,” post Vietnam drawdown, during which there was probably not an emphasis or significant funding for exchange tours. It is interesting that the categories of foreign professional military education and foreign operations, maintenance or support duty are each represented in eleven out of the twelve samples, which signifies some officer corps interest in promoting officers with foreign exchange tours to general officer rank. Given the relatively small number of foreign exchange tours, it indicates that at a minimum, a foreign exchange tour is not the kiss of death. Furthermore, the general trend appears to be increasing. Foreign exchange tours, even when flying, indicate a visionary perspective. By volunteering, the officer displays a sense of curiosity and willingness to at least expose himself to other perspectives and models of officership.

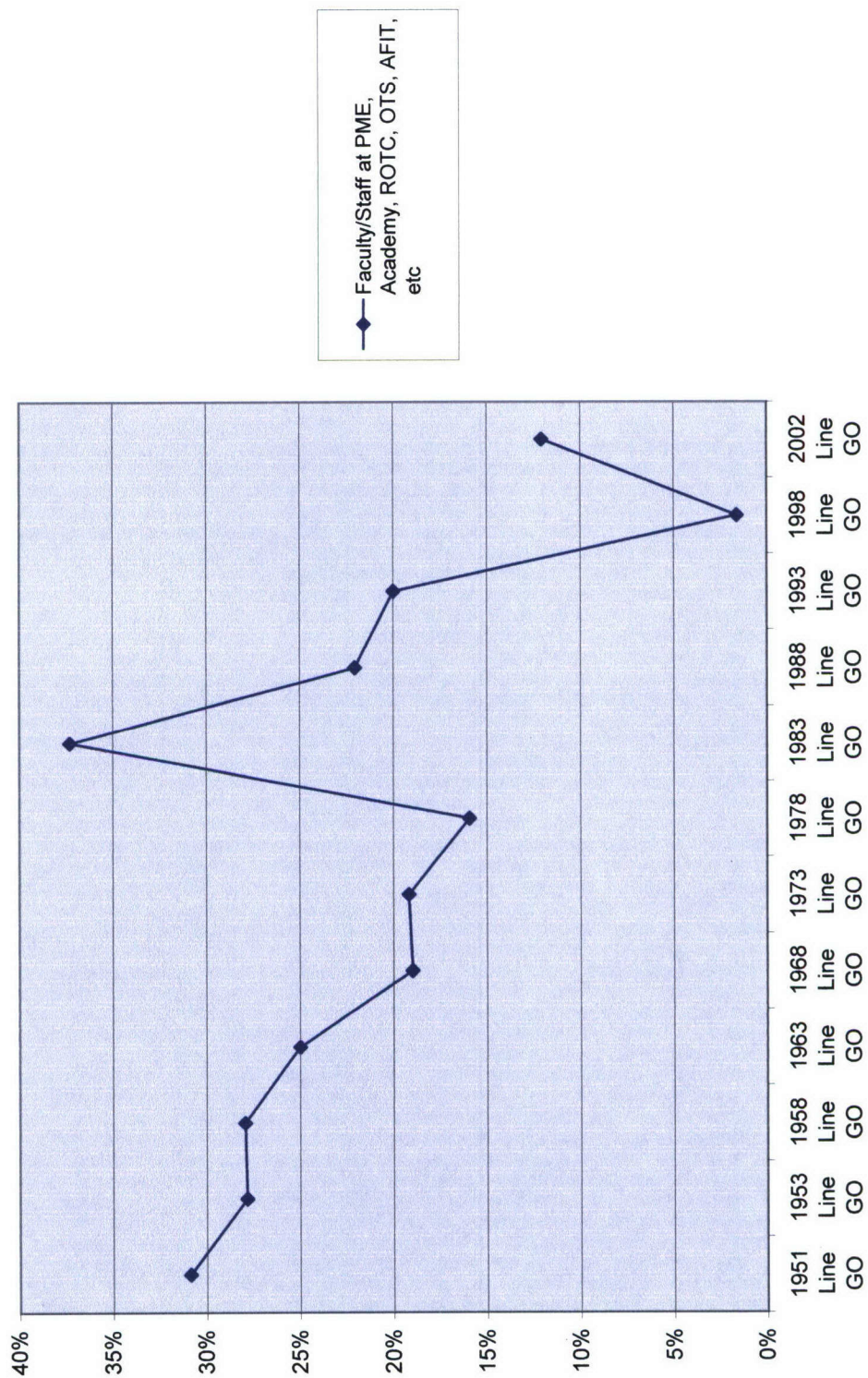
The sub category for faculty or staff duty at officer accession institutions or professional military education institutions is important because from the Huntington perspective, the officer corps’ involvement in the indoctrination training and the passing on of its expertise to new members is a critical part of being a profession. This sub category deals with professional-type training as opposed to technical training such as learning to fly or to establish and maintain a data-link network. If civilians were to become the keepers and trainers of the expertise of the management of violence, the case for an independent profession of officership would be dramatically weakened.



However, as Chart 9-31 (GO Samples: Total Line General Officer Served on School/PME Faculty or Staff by Percent) shows, aside from the big jump in the 1983 sample, where 37% of the line general officers sampled mentioned such a faculty or staff job in the biography, the trend is one of overall decline. The jump in the percentage in the 1983 sample could potentially be the result of post Vietnam surplus pilots being temporarily shunted off to these apparently low status jobs. However, it is not clear if the plunge to 2% in the 1998 sample or the rebound to 12% in the 2002 sample is an anomaly. It would become apparent with more data. In any case, the general declining trend in the percentage of general officers who have served a tour on the faculty or staff of a professional-type training institution is not a positive sign for the profession since it indicates that the understanding of the profession's expertise and the ability to pass it on to new members is not valued within the officer corps.

The sub category of planning a major air campaign or serving in a special planning cell like Checkmate in the Air Staff is included in the exotic characteristics variable because campaign level planning is more visionary than heroic. Planning is the minimum building block for command and control systems, and involves thinking, analysis, and organizational skills of a different type than flying an aircraft in combat. That is not to say that a heroic warrior could not be an excellent planner. Instead, the point is simply that extensive operations planning requires big picture thinking and the integration of and use of C4ISR. Given the tremendous importance of planning in combat operations, it is interesting that relatively small percentages of general officers

Chart 9-31: GO Samples: Total Line General Officer Served on School/PME Faculty or Staff by Percent

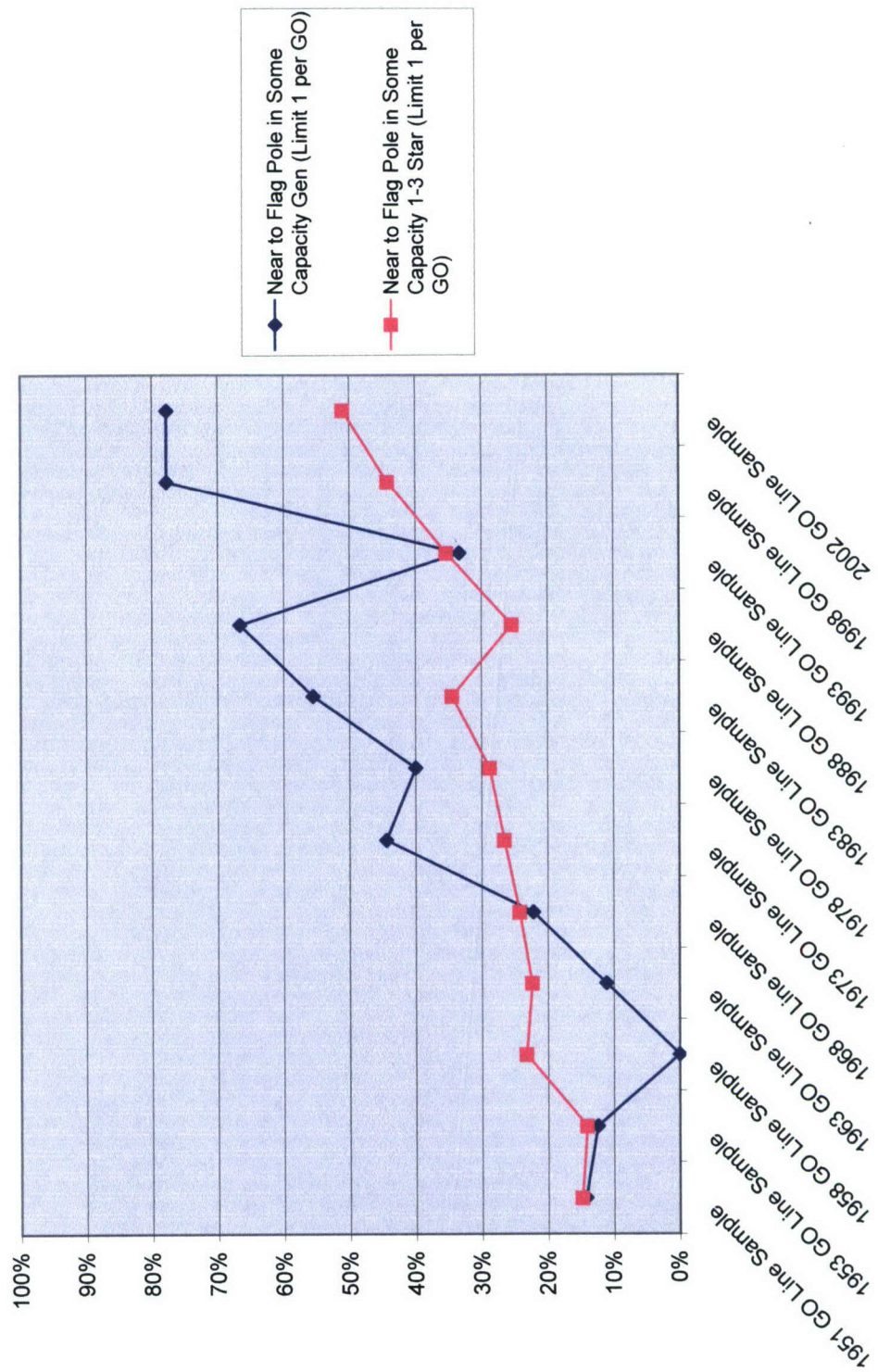




mentioned participation in campaign planning in their biographies. The line general officers (1%) who reported such duty in the 1951, 1953 and 1958 samples based it on their World War II experiences, but then there is a gap until the 1988 sample, after which the percentage varies between 2% and 3% through the 2002 sample. Desert Storm and the publicity that Checkmate received indicate a growing realization within the officer corps that this type of work may actually have more of a claim to being the epitome of Air Force officer expertise than flying. One would suspect that more general officers were involved in campaign-type planning in World War II, Korea, Vietnam, the Cold War, and other operations, but that it is camouflaged within their biographies either because of secrecy concerns or because it has been culturally downplayed within the Air Force officer corps. Of course, it is possible that a dominant heroic warrior culture felt that planners were too exotic to be promoted to general officer rank during the middle sample years.

With respect to differences between 4-star and 1-3 star general officers concerning the exotic tour variable, it makes most sense to address the differences at the level of the sub categories that make up the exotic tour category. With respect to the nearness to the flag pole sub category, Chart 9-32 (GO Samples: General versus 1-3 Star General Officers – Nearness to Flag Pole – Any capacity) shows a clear divergence between the 4-star and 1-3 star general officer ranks after the 1968 sample, except for an anomaly in the 1993 sample. The percentage of 4-star general offices with some sort of nearness to the flag pole is over 50% by the 1983 sample and is level at 78% in the

Chart 9-32: GO Samples: General versus 1-3 Star General Officers -- Nearness to Flag Pole --  
Any Capacity





1998 and 2002 samples, while the percentage of 1-3 star generals with nearness to the flag pole does not cross the 50% mark until 2002. The bulk of the curves are made up of the aide/military assistant sub category, which shows the same clear difference between the 4-star and 1-3 star general officers, except for the 1993 anomaly. See Chart 9-33 (GO Samples: General versus 1-3 Star General Officers – Nearness to Flag Pole – Aide/Military Assistant). However, the ASTRA sub category curves also indicate a divergence with one-third of the 4-star generals being ASTRA graduates in the 1998 sample versus just 8% of the 1-3 star general officers. See Chart 9-34 (GO Samples: General versus 1-3 Star General Officers – Nearness to Flag Pole – Air Staff Training Program). However, ASTRA reporting only occurs in the 1993 through 2002 samples, the percentage of 1-3 star general officer ASTRA participation appears to be steadily rising, and the 4-star general officer participation dropped to 22% (2 officers) in the 2002 sample. Nevertheless, nearness to the flag pole is clearly a desired experience in the 4-star general officer ranks. The curves (not shown) for the percent of 4-star and 1-3 star general officers whose biographies mentioned legislative liaison type tours do not show any clear-cut differences between the rank groupings.

With respect to exchange tours at the amalgamated level, 4-star general officer reporting is not dramatically different from 1-3 star reporting, except in the 1993 sample, where the 4-star percentage of officers reporting some type of exchange tour shoots from roughly 20% in the 1998 sample to over 50%, and the 1-3 star percentage drops from approximately 20% in the 1998 sample to 12%. Within the exchange tour

Chart 9-33: GO Samples: General versus 1-3 Star General Officers -- Nearness to Flag Pole --  
Aide/Military Assistant

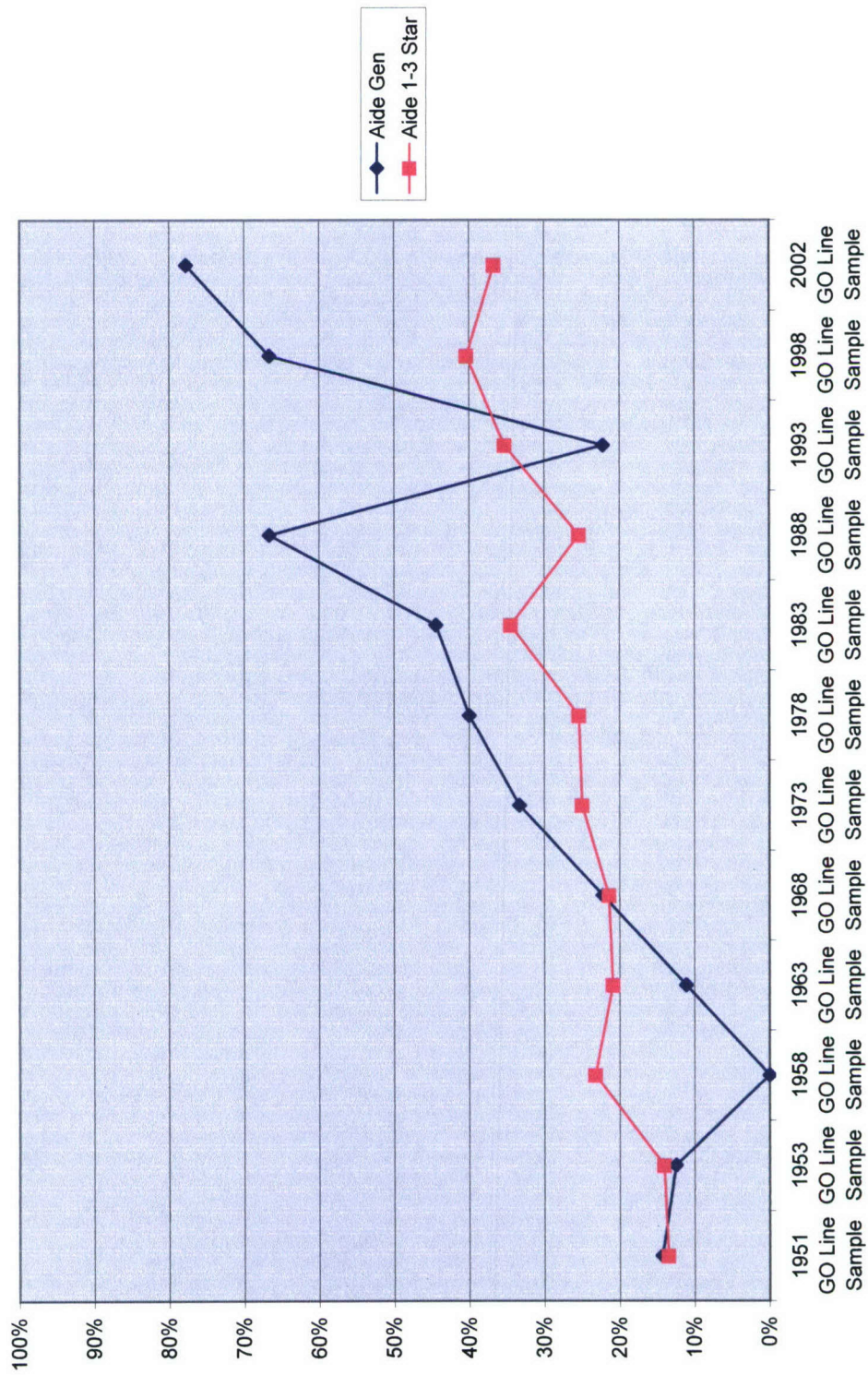
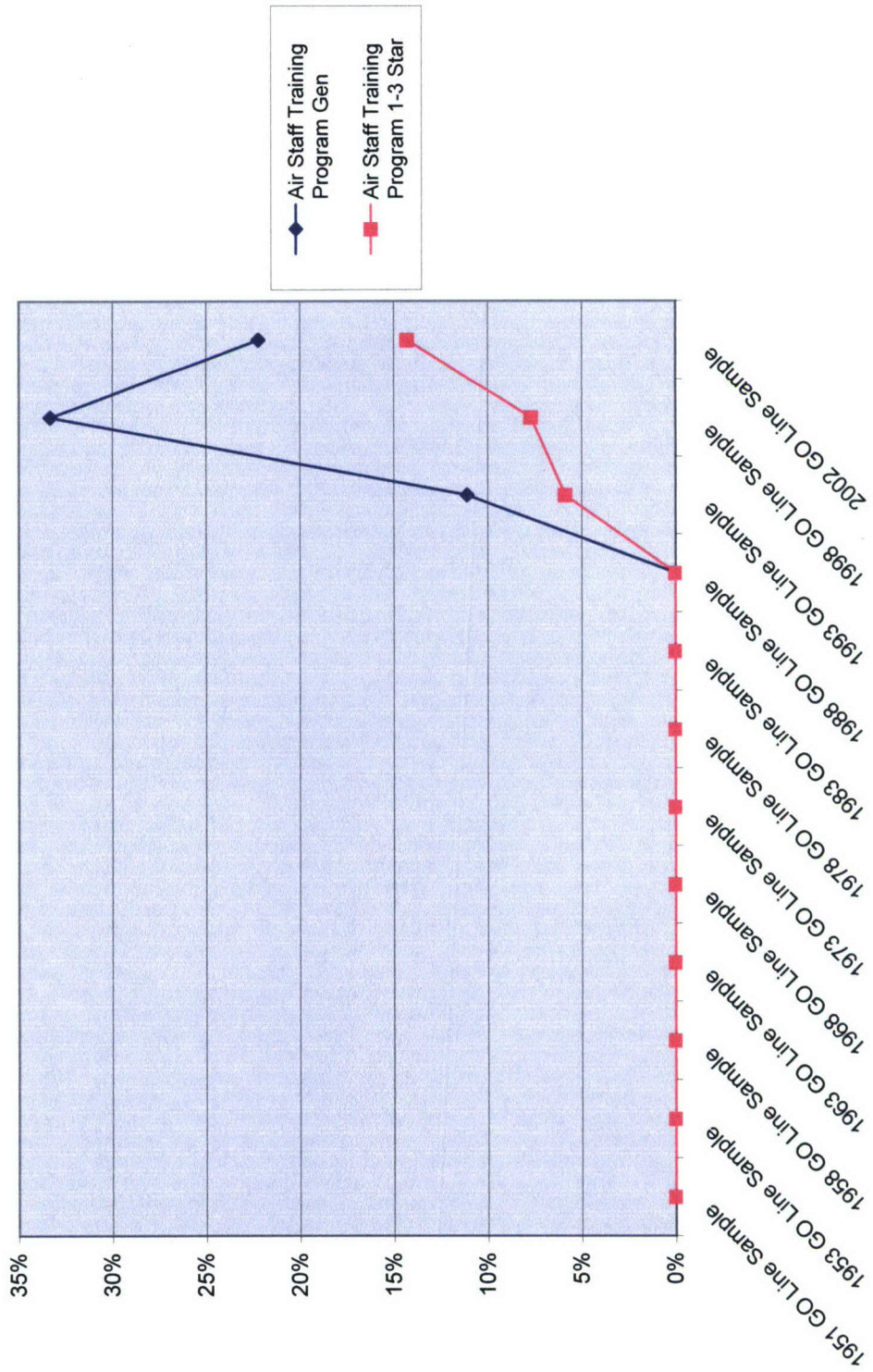




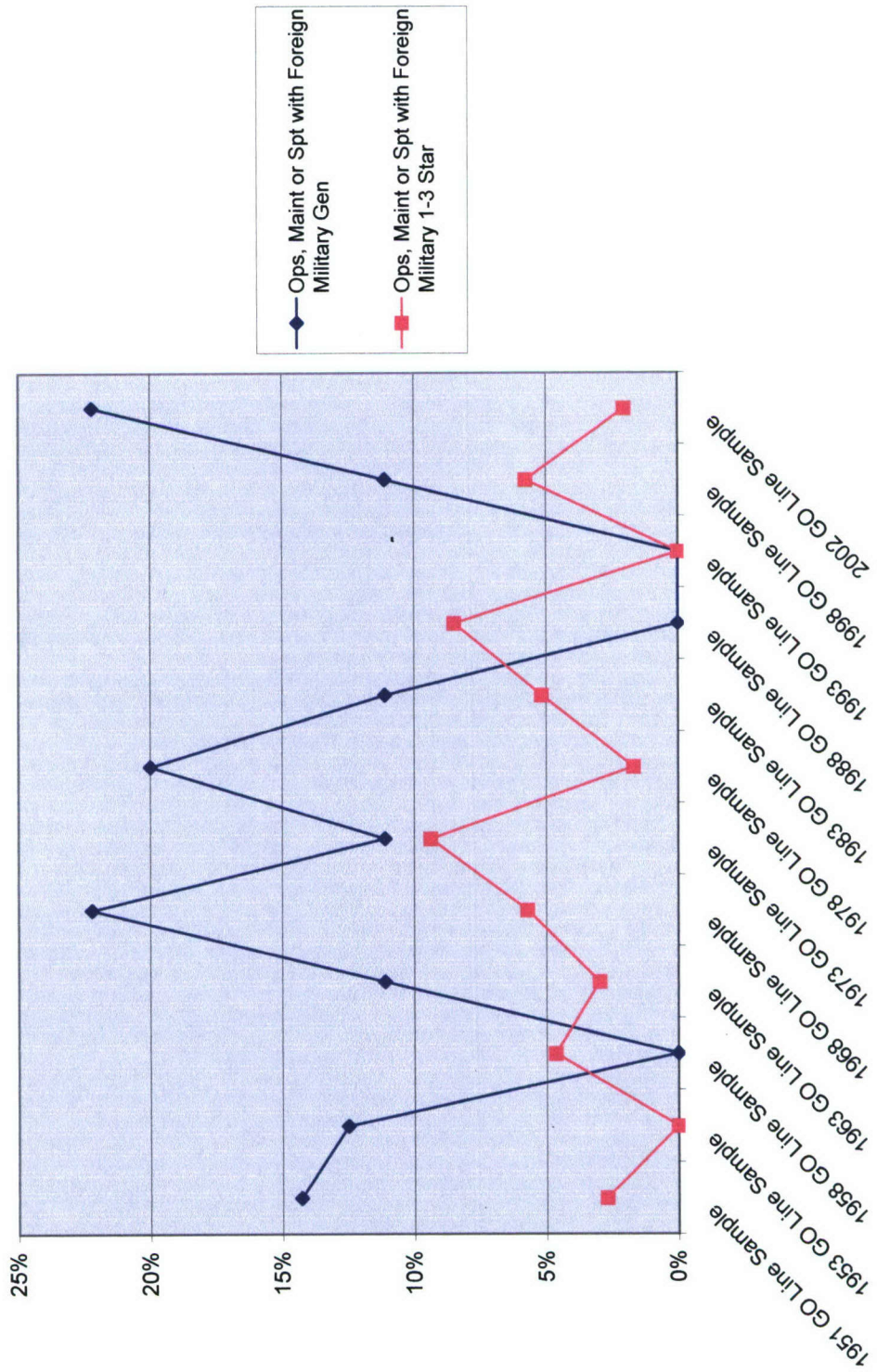
Chart 9-34: GO Samples: General versus 1-3 Star General Officers -- Nearness to Flag Pole --  
Air Staff Training Program



sub categories, two observations stand out. First, the only exchange tour sub category with fairly consistent 4-star general officer reporting is that of operations, maintenance or support tours with a foreign military. One or more 4-star generals reported an exchange tour within that category in nine out of the twelve samples, yielding percentages between 11% and 22% for these nine samples. See Chart 9-35 (GO Samples: General versus 1-3 Star General Officers –Exchanges – Operations, Maintenance, or Support with Foreign Military). The 1-3 star reporting is erratic, ranging from 0% to 9% per sample. Despite the erratic nature and low level of reporting within the 1-3 star ranks, there is some evidence that this type of exchange tour is in fact valued at the 4-star level. The second observation is that 4-star general officer reporting of exchange tours in the other categories is very sporadic. For example, even though operations, maintenance, support and professional military education tours with other US military services were counted from the 1968 sample onwards, 4-star biographies only reported these type tours in the 1983, 1993 and 1998 samples, with two 4-star generals or 22% of the sample in both the 1983 and 1993 samples. The 4-star general officer reporting is similar with the foreign/civilian and the foreign professional military education sub categories. In fact, the anomaly in the 4-star general officer 1993 sample is caused by the apparently random coincidence of having two 4-star generals with exchanges with US services, two with the foreign/civilian (Fulbright, Olmsted, State Department), and one with a foreign professional military education tour all at the same time.



**Chart 9-35: GO Samples: General versus 1-3 Star General Officers -- Exchanges -- Operations, Maintenance, or Support With Foreign Military**



At the 4-star general officer level, service as faculty or staff at professional military education or officer accession training institutions appears to be very erratic. In some samples, about one-third of the 4-star generals reported this faculty/staff experience, but in two samples, no 4-star general officers had the faculty/staff experience. The erratic nature of the reporting indicates that there is not a firm consensus within the 4-star ranks on whether participation in the professional training of succeeding generations is important or not within the profession's most senior leadership level.

Participation in the planning of major air campaigns or service in special planning organizations like Checkmate appears to be valued at the 4-star level. The 1951 and 1953 samples each have only one general officer reporting campaign planning. In both cases, the officer is in the 1-3 star rank. In the 1958 sample, however, the single report is in a 4-star general's biography. Then there is a drought of campaign planners until the 1988 sample. In the 1988 and 1993 samples, there is once again only one 1-3 star general officer reporting campaign planning experience. However, in the 1998 sample, there are two 4-star generals, but no 1-3 star generals, and in the 2002 sample, one 4-star, but no 1-3 star generals. Since the 1-3 star reporting level is so low, the fact that 4-star generals with planning experience, and in fact two in the 1998 sample, are selected for 4-star rank is a strong indication that this visionary characteristic is indeed valued at the 4-star level. Overall, the exotic characteristics variable indicates a growing appreciation within the general officer ranks



of the importance of new ideas and experiences. However, the decreasing trend in general officers who have served on the faculty or staff of PME institutions as well the indications of increasing potential politicization in the nearness to the flag pole and in the legislative liaison sub variables indicates major changes away from the Huntington model of profession.

### Conclusion

This chapter provided an analysis of large amounts of survey data, categorized into several variables that potentially indicate the positive evolution of visionary warrior perspectives within the general officer corps. The first variable examined the evolution in the initial and in the apparent Air Force Specialty (Career Field) Codes of the line general officer samples. The data indicated that as the number of non-pilot line general officers has increased, so has the diversity of these officers in terms of the career fields. This demonstrates a growth in the visionary warrior perspective since these non-rated career fields are no longer perceived as places to which general officers can turn for specialist advice. Instead, officers from these career fields are being accepted into the general ranks, i.e., into the inner core of the profession. The second variable looked at the reporting of total flying hours, combat sorties/hours, and hot stick awards as indicators that pilot skills were being used as proxy variables for leadership and decision-making abilities. The data indicated that in earlier samples, it was not important to draw attention to one's pilot skills by listing one's total flying hours or combat sorties in the biography. Such reporting increased during the Vietnam War, and

may indicate pilot insecurity as the percentage of non-pilots in the officer corps increased. By the later samples, a statement on one's total flying hours and combat sorties appears to be mandatory. This also has the effect of highlighting the absence of the statement in non-rated general officer biographies. This trend indicates a growth in at least the appearance of the heroic warrior perspective among general officers, even as the percentage of non-rated officers was increasing. On the other hand, the situation is much more complex with respect to the hot stick sub variable. Both heroic warriors and visionary warriors can point to the increasing importance accorded to Fighter Weapons School graduates and Forward Air Controllers (FACs) as evidence of the acceptance of their perspectives. However, since actual pilot skills are not the central focus of the FAC job, it is clearly visionary. The original Fighter Weapons School curriculum was obviously very flying dependent. However, the name change to simply Weapons School indicated a change to a much more C4ISR integrated approach to warfare. The variable of command, like flying hours and combat sorties, is important because it appears to be a required statement in the more recent sample biographies. This is particularly noteworthy in the case of command because command of a squadron, group or wing has lost all combat significance since at least the Vietnam War. The modern positions of higher-level combat leadership are found in positions of responsibility in the visionary CAOC and in the C4ISR system. However, the officer corps remains fixated on the squadron, group, and wing structure, which appears to foster the heroic warrior perspective. On the other hand, non-rated officers can also make mandatory



statements on command, although their commands are non-flying. In addition, command experience is not as prevalent as one might think. The sample data indicates that less than 60% of general officers per sample had wing-level command. Furthermore, the percentages of general officers reporting their first or only wing-level command in non-flying is increasing, as is the percentage reporting their first or only flying wings being something other than the traditional bomber or fighter wing. These are all indications of a shift from the heroic to the visionary warrior.

A statement on professional military education, like flying hours and command experience, appears to be a requirement in the biographies, although there is no overt linking of professional military education to flying. The professional military education variable is important because it concerns the learning of professional knowledge, which forms the basis of a profession. It is particularly important in the case of military officers because the knowledge is not front-loaded as in medical or law school. Instead, in the military, it is distributed across an officer's career, theoretically in a building block approach that makes use of the officer's experience. If officers can become members of the profession's inner core without attending the professional military education courses, then there would appear to be no professional knowledge, and probably no profession. Furthermore, since professional military education deals with strategy, operational art, and civil-military relations, and not technical skills like flying, professional military education is inherently visionary. Consequently, it was no surprise that over the course of the sample period, attendance at senior service school

appears to have become a prerequisite for promotion to general officer rank. The trend for attendance at intermediate service school lags behind the senior service school curve, and in fact appears to have leveled out at 90% over the last three samples. In addition, the percentage of general officers who reported their first or only senior service school to be joint, i.e., either at the National War College or Industrial College of the Armed Forces, has climbed steadily through the sample period to the point where it is 49% in the 2002 sample. This indicates a visionary warrior perspective.

The last two variables concerned the value that the general officer corps' places on broader perspectives in its ranks. The career broadening variable looks at duty tours that officers have served outside of their career fields, but still within typical career fields within the Air Force. The exotic characteristics variable looks at duty tours outside of the Air Force or more atypical tours such as serving as aides or in legislative liaison within the Air Force. The career broadening variable examined whether officers who were promoted to general officer ranks tended to have been specialists, whether in rated or non-rated capacities, or generalists. The data indicated that only about one-third of the general officers reported at least one career broadening tour, which points to a rather stove-piped system of officer development until reaching general officer rank. It also indicated that the personnel system does not contribute to the development of visionary perspectives for the majority of the general officers. Whether a pilot or an intelligence officer, the officer corps appears to favor officers with narrow, focused experience in one field.



The exotic characteristics variable consisted of several sub variables, which matched different types of exotic duty tours that officers may have served prior to becoming general officers. Duty tours as aides or in legislative liaison are important because they potentially impinge on the officer corps' understanding of profession. If serving as an aide were to become a prerequisite to promotion to general officer ranks, political skills could become more important than expertise in warfare within the profession. Aide duty actually makes up the biggest component of the nearness to the flag pole sub variable. The most important observation on this sub variable was that there is a clear divergence between the 4-star and 1-3 star data. Although both show increasing trends, by the 2002 sample, the percentage of 4-star general officers with a nearness to the flag pole tour is 78%, whereas it is only 50% for the 1-3 star general officers. This sub variable seems headed to becoming a prerequisite for 4-star rank. An emphasis on duty in legislative liaison would potentially signal a shift away from the apolitical Huntington model.<sup>309</sup> There were no reports of legislative liaison duty until the 1963 sample. However, at least one general officer per sample reported a legislative liaison tour from 1963 through 2002, and despite some erratic swings, the percentage of general officers who served a tour in legislative liaison reached 10% in the 1998 and 2002 samples. This indicates that the general officer corps is attaching an increasing importance to legislative liaison tours. Although attendance at senior service school is almost a prerequisite for promotion to general officer, the percentage of general officers

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<sup>309</sup> *Apolitical* in the sense of not participating in partisan politics.

who have served a tour on the faculty or staff of a professional-type training institution is marked by a generally declining trend. Consequently, on the one hand, it is important to attend professional military education, but the officers passing on the profession's knowledge are not valued within the officer corps. This is obviously not a positive sign for the profession, and although it has no direct correlation to the heroic versus visionary warrior debate, instructors at professional military education courses would more likely be visionary warrior proponents since they teach high level, all encompassing courses. Given the relatively small number of foreign exchange tours, it is surprising that many officers who served in these clearly exotic duty tours were promoted to general officer ranks. In fact, it may even be a desired characteristic since the general trend appears to be increasing, which indicates more exposure of the profession's most senior level to different perspectives and models of officership and warfare.

Although not every variable analyzed in this chapter can be argued as a clear case showing the evolution of visionary warrior perspectives within the general officer corps, it is clear that the characteristics of the general officer corps have changed in a variety of measurable ways over the course of the samples. Many of these changes indicate an increasing acceptance of the visionary warrior perspective, and some of these changes indicate potential changes in the officer corps' understanding of profession. The Air Force Specialty Code variable and the discussion on the hot stick sub variable of weapons school graduates and FACs pointed specifically to an



increasing appreciation of C4ISR within the general officer corps. Chapter 10 will provide a more detailed analysis of this rising importance of C4ISR.

## **Chapter 10: The Evolution of C4ISR Within the General Officer Ranks**

### **Introduction**

This chapter follows on the ground work established in Chapter 9's analysis of various variables indicating the evolution of potentially visionary characteristics in the general officer corps. This chapter provides an in-depth examination of a variety of C4ISR indicators in the general officer sample data to document the increasing importance of C4ISR to the general officer corps. A determination that officers serving in C4ISR billets are part of the inner core of the Air Force officer corps profession provides strong support for the contention that the Air Force officer corps' sense of mission and membership has been and is continuing to shift away from a flying emphasis based on pilot officers towards a broader perspective of visionary warfare that is based on C4ISR technology and officers with C4ISR experience. Certainly cuts in overall numbers of aircraft, rising ratios of non-rated officers per total Air Force aircraft, investment in ICBMs, space, intelligence, command, control and communications systems, long-range precision munitions, and unmanned aerial vehicles all indicate a decreasing emphasis on manned flight, from the technological point of view. However, the profession is a grouping of people, not of machines. The officer corps could conceivably continue to see its basis in the heroic warrior archetype and the image of combat between manned aircraft. Pilots would then comprise the inner core of the profession, with a host of other support types of officers floating on the periphery. From this perspective, these peripheral officers would be necessary for the profession to



function independently and thereby retain both its independent status and its jurisdictions. However, these peripheral officers would be technical auxiliaries, excluded from the inner core and senior leadership positions within the profession.

If this were the case, one would expect C4ISR officers to work in narrow career tracks, with minimal career-broadening or professional development opportunities. Promotion rates would not be particularly high, few would make it through the system far enough to be promoted to colonel, and very few would ever become generals. The lower ranks of the C4ISR career fields would be manned exclusively by specialists, with more pilots present in the C4ISR field grade ranks, and predominantly pilots serving in C4ISR billets at the colonel and general officer levels. Air Force general officers would primarily be pilots with almost no C4ISR experience until the rank of colonel. In fact, they could expect most C4ISR duty to actually occur in the general officer ranks. At the opposite extreme, i.e., the case in which the visionary senior leadership of the Air Force officer corps consciously worked to not only exploit new non-piloted and non-flying technologies but also to reorient the composition and focus of the officer corps, one would expect to find core C4ISR career fields, whose officers developed broad experience bases in other aspects of C4ISR as well as the Air Force activities in general, complemented by large numbers of pilots with C4ISR tours early in their careers. C4ISR officers would not be forced to remain in narrow career tracks, capped at the colonel level. Air Force general officer ranks would be loosely

representative of the career field composition of the field grade and company grade ranks.

The data analysis in this chapter will help to identify which scenario seems most descriptive of the Air Force officer corps.<sup>310</sup> The chapter begins by documenting the clear trend of increasing percentages of general officers with apparent C4ISR career field codes. Although the trend shows clear increases in C4ISR general officers, the numbers are still too small to account for all the C4ISR jobs in the Air Force. Since large numbers of rated officers have traditionally served in non-rated billets, the next section examines the percentages of line general officers who reported serving in C4ISR jobs in the following three rank categories: Lieutenant colonel and below, colonel, and general officer. This chapter concludes with an analysis of the trend of the increasing wear of non-rated badges, and in particular space and missile badges, by line general officers. This provides another indication of the ample evidence that the general officer corps has not only become increasingly aware of the importance of C4ISR, but has increasingly become more experienced in C4ISR and visionary forms of warfare.

#### Increasing Percentage of General Officers with C4ISR Air Force Specialty Codes

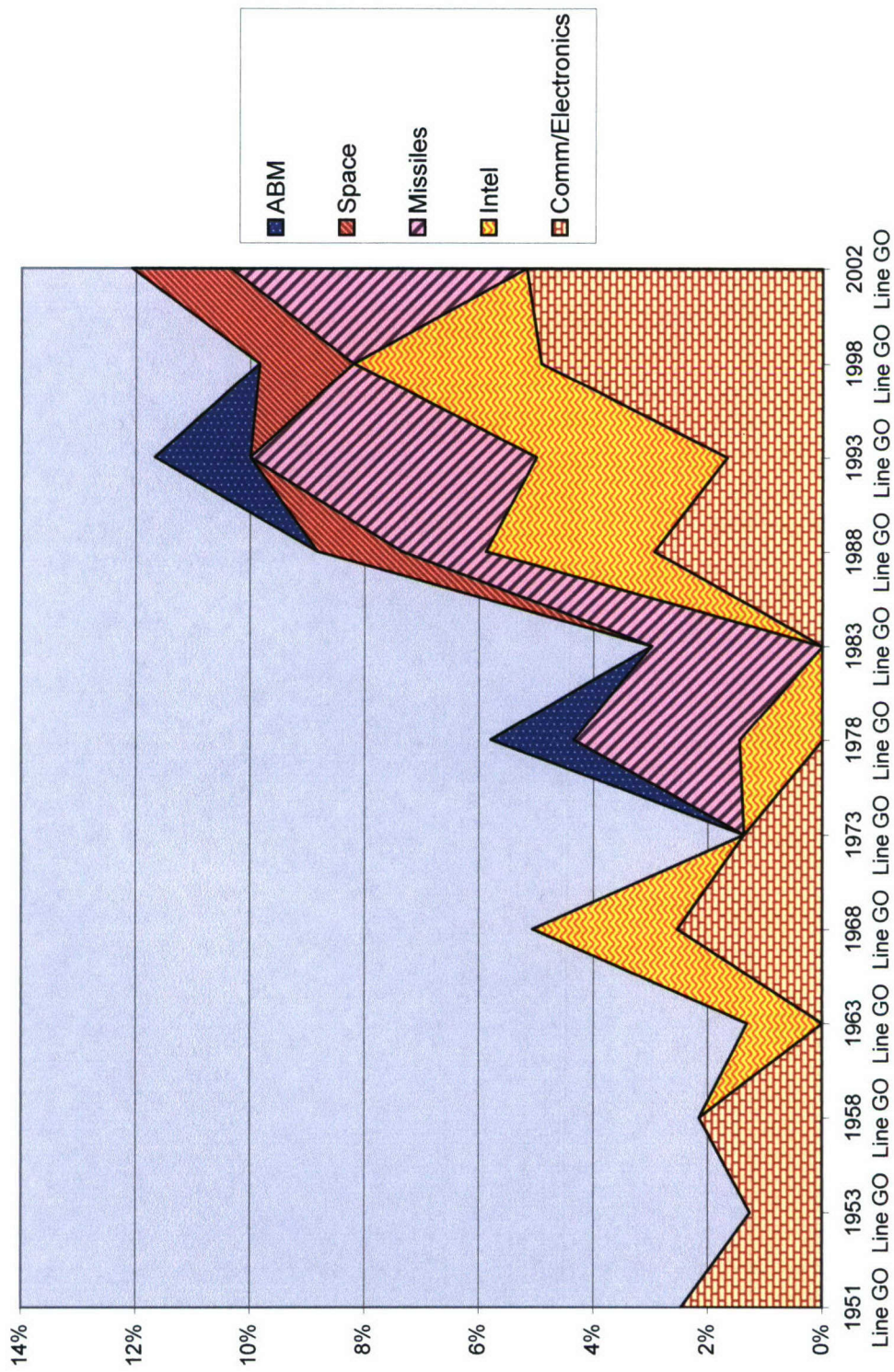
Chart 10-1 (GO Samples: Total Line General Officers Initial C4ISR-Type AFSC by Percent) and Chart 10-2 (GO Samples: Total Line General Officer C4ISR-Type Apparent Air Force Specialty Codes (AFSC) by Percent) provide a comparison

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<sup>310</sup> The data set, process and caveats are the same used in Chapter 9.

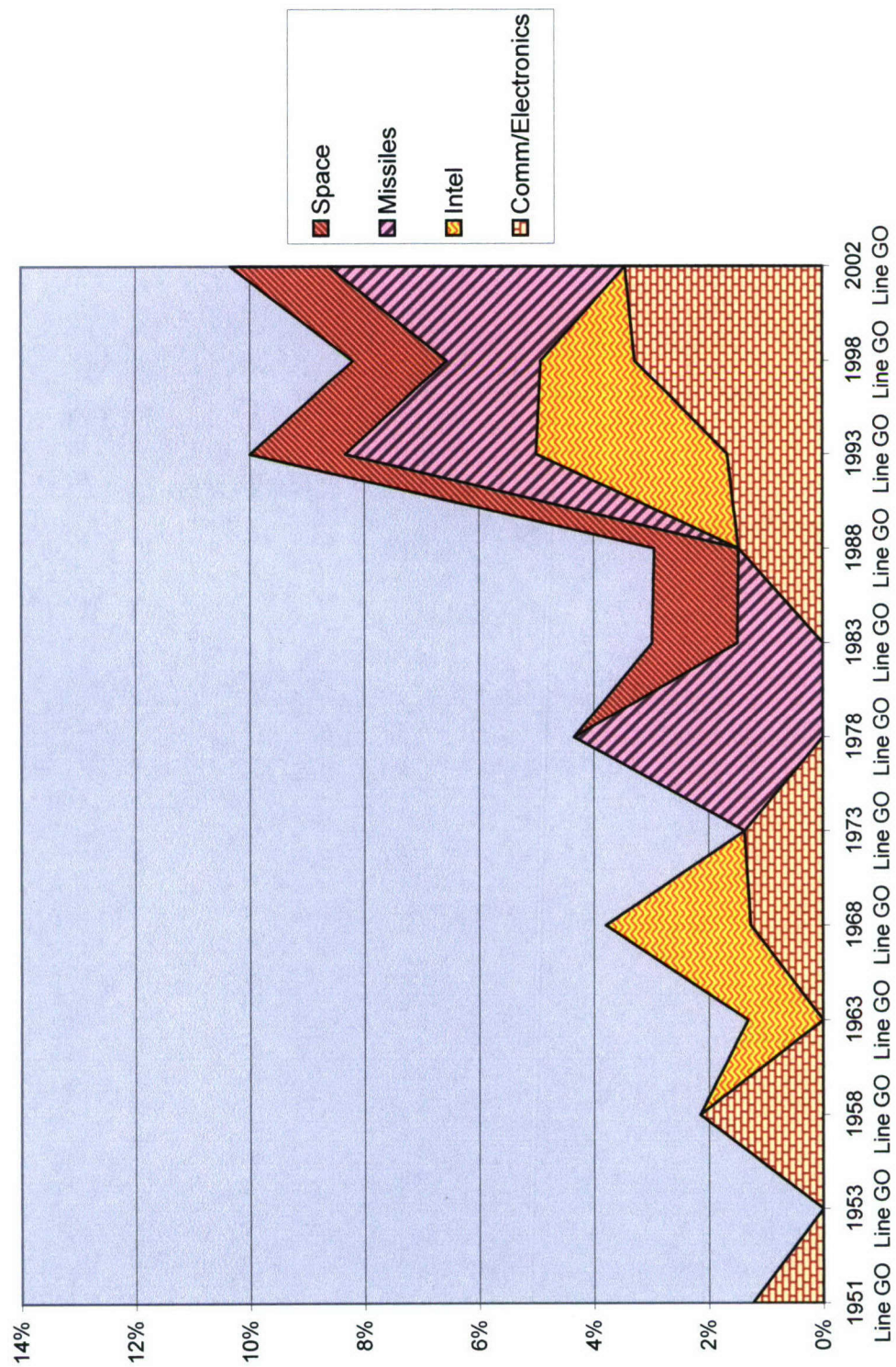


Chart 10-1: GO Samples: Total Line General Officers Initial C4ISR-Type AFSC by Percent





**Chart 10-2: GO Samples: Total Line General Officer C4ISR-Type Apparent Air Force Specialty Codes (AFSC) by Percent**





between the *initial* Air Force Specialty Codes and the *apparent* Air Force Specialty Codes in the general officer samples. The communications/electronics, intelligence, and air battle manager career fields all experienced net losses, missiles experienced gains and losses, and space gained. Air battle manager losses were such that the career field disappears when looking at general officer apparent Air Force Specialty Codes, i.e., the two general officers who were originally air battle managers appear to have switched to other career fields, and no officers moved into the air battle management career field. It is a reflection of the historically poor status of the career field, which is the nexus between the rest of the C4ISR functions and operations. Although extremely important for air operations, the flying operations focus of the career field has placed air battle managers in a position akin to navigators in that they must directly compete with pilots for jobs and promotions, while being denied command of flying units (until the late 1990s). Furthermore, ground-based radar control squadrons were typically amalgamated with fighter units. Missiliers experienced similar problems with missile units eventually being amalgamated with bomber units. However, the dissolution of Strategic Air Command and the incorporation of missile units into Air Force Space Command created a non-flying major command with a combat mission and the possibility for high-level command by non-flyers. Space's evolution out of air defense and combination with the missile career fields offers some degree of overlap in these functional fields, which is reinforced by the role of space assets in intelligence collection. Chart 10-1 (the initial C4ISR-type AFSC chart) indicates uneven, but long-

term growth in the percentage of general officers who started their officer careers in C4ISR billets. The chart peaks in the final 2002 sample at 12% of the line general officer corps. Chart 10-2 (the apparent C4ISR-type AFSC chart), however, shows more erratic growth and a peak in 2002 closer to 10%. The difference between the two reflects the net losses in the C4ISR amalgamation due to the general officers having switched specialties during their careers.

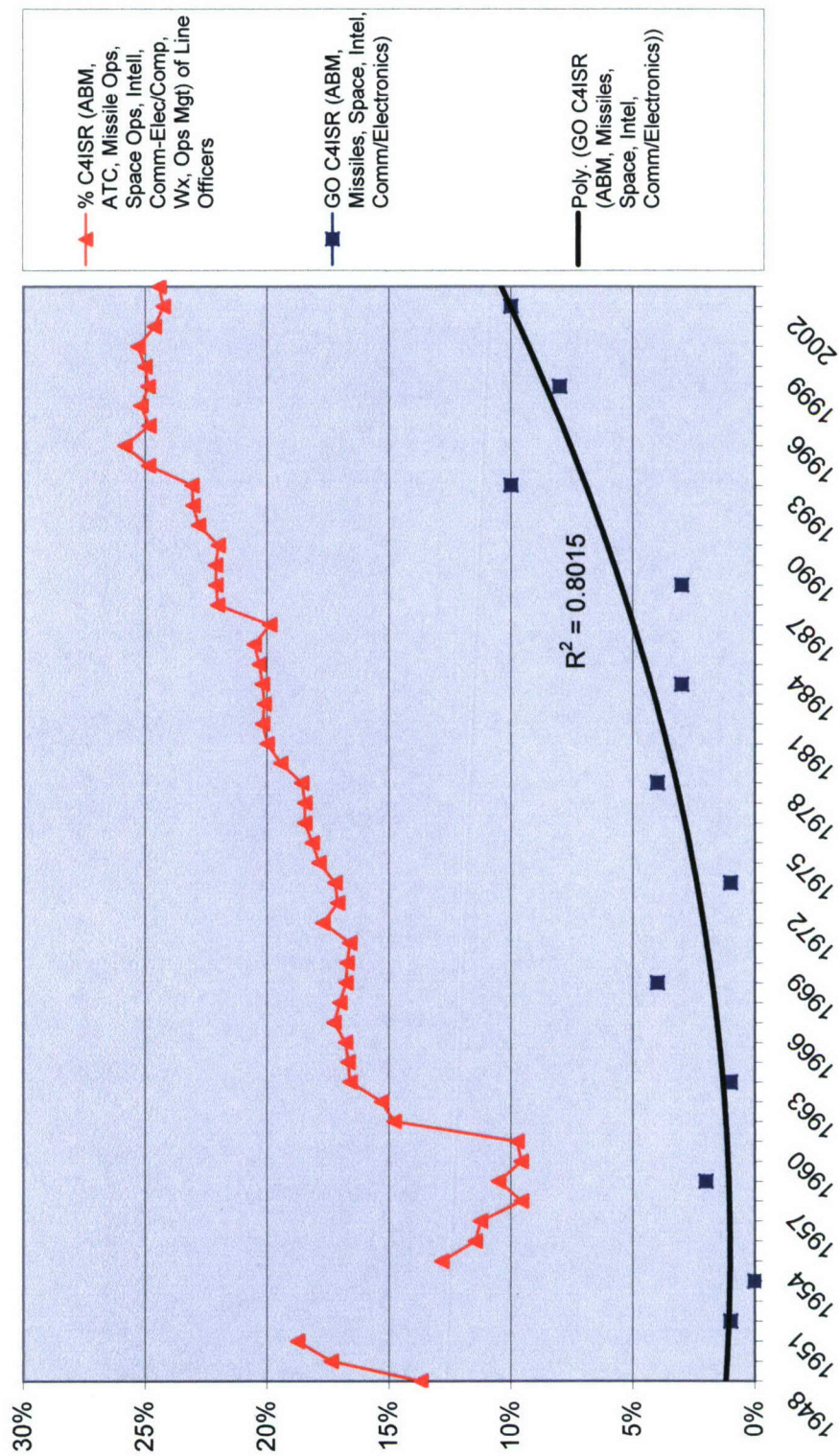
Although 10% of the line general officer corps is not a big number, the increasing tendency is clear. For example, Chart 10-3 (Comparison of C4ISR Amalgamated Line Officer Career Field Billets as Percentage of Total Line Officers versus General Officer Sample Data C4ISR Amalgamation) provides a comparison of the C4ISR Amalgamation of line officer career field billets and the general officer sample data C4ISR amalgamation. From 1961 to 2002, the line officer data shows a relatively steady climb in the number of C4ISR billets from 15% to 24%. The general officer sample data from 1963 to 2002 shows a more erratic climb from 1% to 10%. In addition, a second order polynomial line drawn on the chart offers a smoothed version of the sample data with a relatively high correlation ( $R^2=0.80$ ) value.<sup>311</sup> This adds credence to the upward tendency apparent in the other charts and implies a systematic growth. There is no Air Force requirement that general officer billets are doled out to match personnel ratios between officer career fields, so the general sense of parallel growth between overall line C4ISR officers and general officers with apparent C4ISR

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<sup>311</sup> I chose the second order polynomial because it provided the best fit (highest correlation).



**Chart 10-3: Comparison of C4ISR Amalgamated Line Officer Career Field Billets As Percentage of Total Line Officers versus General Officer Sample Data C4ISR Amalgamation**



specialties is important.<sup>312</sup> However, the fact that the general officer curve remains at a steady 15% under-representation from 1961 onwards indicates the strength of the structural factors discussed in Chapters 7 and 8.

#### Line General Officers Who Served in C4ISR-Type Jobs

Since the earlier comparison of the numbers of rated line officers and rated line officer billets showed that large numbers of rated officers routinely serve in non-rated billets, it is clearly a possibility that the percentage of general officers who have served in C4ISR billets greatly exceeds the number of general officers with C4 ISR specialty codes. The general officer biography sample data permits a quantitative, but nuanced, analysis of this issue over time. The first set of charts provides data on the total percentages of line officers that have served in C4ISR billets in the three rank categories of lieutenant colonel and below, colonel, and general officer. Each chart is independent, capturing the percentage for that rank category. A particular officer might be counted in none, one, two, or all three charts, depending on the breadth of that officer's experience in C4ISR jobs. However, only the officer's first C4ISR billet per rank category is counted.

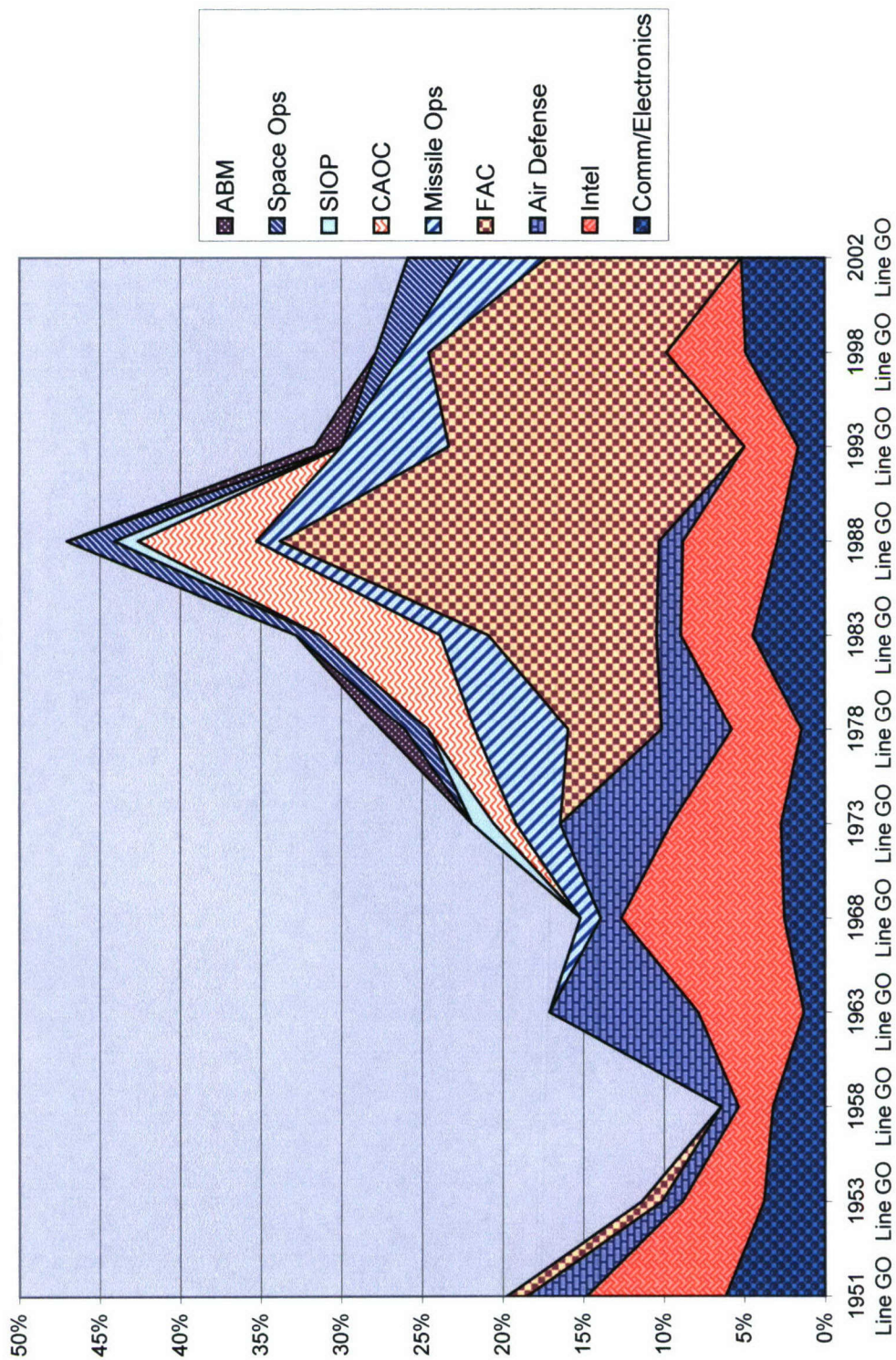
Chart 10-4 (GO Samples: Total Line General Officer C4ISR First Tour in Rank of Lieutenant Colonel & Below, by Percent) indicates an overall decline from approximately 20% of line general officers having some sort of C4ISR job in their

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<sup>312</sup> For example, the apparent maintenance/logistics general officer sample data is much more erratic than the apparent C4ISR general officer data, which results in a lower correlation ( $R^2 = .35$ ) second order polynomial line with increasing slope while the percentage of maintenance/logistics officer billets of line officer billets has decreased steadily since the Korean War.



**Chart 10-4: GO Samples: Total Line General Officer C4ISR First Tour in Rank of Lieutenant Colonel & Below, by Percent**



biography in the rank of lieutenant colonel and below in the 1951 sample to only 6% in the 1958 sample. However, from 1958, the curve generally climbs, peaking at 47% in the 1988 sample. The curve decreases sharply to the 1993 sample data, then continues to decrease, but at a lesser slope through 2002, where it ends with 26% of the line general officer sample having C4ISR jobs in the rank of lieutenant colonel and below in their biographies. The chart indicates that some generals in each sample have performed communications/electronics career field work in the ranks of lieutenant colonel and below. Tours in intelligence are another mainstay, being represented in every sample except 2002. The rest of the chart reflects the changing nature of Air Force warfare throughout the period. Air defense is represented in each sample through 1988 and then disappears. This reflects the importance of air defense as an original Air Force mission that helped solidify the case for an independent Air Force, the heavy investment in the SAGE air defense network in the 1950s, and the subsequent decline in the importance of air defense after the fielding of ICBMs in the 1960s. Officers whose biographies mentioned operational liaison duties with ground and naval forces in World War II represent the initial FAC representation, while the general officers with FAC experience from 1978 through 2002 indicate the importance of FACs in Korea and especially in Vietnam. The first general officer with operational type experience in missiles made his debut in the 1968 sample, and this field remains represented in each sample since then. CAOC-type experience is first reported in the 1973 sample biographies, and this Vietnam-effect continues through 1988. References to SIOP



planning at the lieutenant colonel and below level are few and far between. Only officers in the 1973 and 1988 samples mentioned it. The first officer mentioning space operations in his biography appeared in the 1978 sample, lagging missiles by a decade, but also preceding the inauguration of Air Force Space Command by two years. From the 1978 sample onwards, the space operations category is represented each year, except in the 1993 sample. Finally, the chart shows the initial tours of the two general officers whose initial Air Force Specialty Code was air battle manager.

The peak of 47% of the line general officer biographies containing references to C4ISR jobs in the 1988 sample is primarily a result of the Air Force officer corps' Vietnam War experience. FACs, whose command and control system role was so important in the war, account for 24% of the C4ISR jobs reported, and CAOC-type duty in Southeast Asia adds another 7%. Although these could be considered aberrations in a data collection sense, it is hard to argue that peacetime operations are the norm and wartime events an aberration for the Air Force officer corps as a profession since wartime operations are its jurisdiction and primary *raison d'être*. Furthermore, the fact that the general officers valued the FAC and CAOC tours of duty enough to include and sometimes explain them in their biographies indicates a sense that these were important events in their professional development. FAC tours in the rank of lieutenant colonel and below continue to be reported and still account for 12% of the C4ISR-type jobs in the 2002 sample. On the other hand, CAOC tours at the lieutenant colonel and below level were only reported between 1973 and 1988. This is not reflective of an end to

CAOC entities in the Air Force. In fact, Air Force operations continued and still continue to rely on Tactical Air Control Centers and other CAOC entities to plan and conduct major air operations. However, the difference between the FAC tour and the CAOC tour is illustrative of the struggle between the heroic warrior and visionary archetypes.

The airborne FAC is actually a mixture of the heroic warrior and visionary. The FAC's primary purpose is visionary in that the FAC exists to communicate and coordinate with the ground forces, the command and control system and fighter and bomber aircraft in order to most efficiently and effectively direct other aircraft to destroy targets and support the ground forces. The FAC concept transfers a large amount of decision-making and responsibility out of the fighters' and bombers' cockpits and into the command and control system. However, since the archetype Vietnam FAC was airborne, in a slow moving, propeller-driven O-1 or O-2 aircraft, the FAC is also in some ways the epitome of the heroic warrior. First of all, he was piloting. Second, he was low and slow, in rifle range of enemy troops, with no effective weapons of his own. Third, he was so good that he could talk with troops on the ground, the command and control system and fighters, fly the airplane, and direct the fighters onto targets as bullets whizzed around him. By contrast, the fighters had it easy. They were flying high, well above the accurate range of small arms and antiaircraft fire, and fast. They swooped in, were talked onto the target, dropped their bombs, and zoomed home. The FAC stayed to survey the damage and direct further



fighter attacks. Consequently, a reference to a FAC tour creates a complex image in which piloting plays a small, but not insignificant role, whereas command and control over fighters plays a bigger, but perhaps less culturally significant role, and coolness under fire is the critical component. Furthermore, a tour as an airborne FAC for a pilot is not seen within the officer corps as a career-broadening type tour since it is still a flying tour.

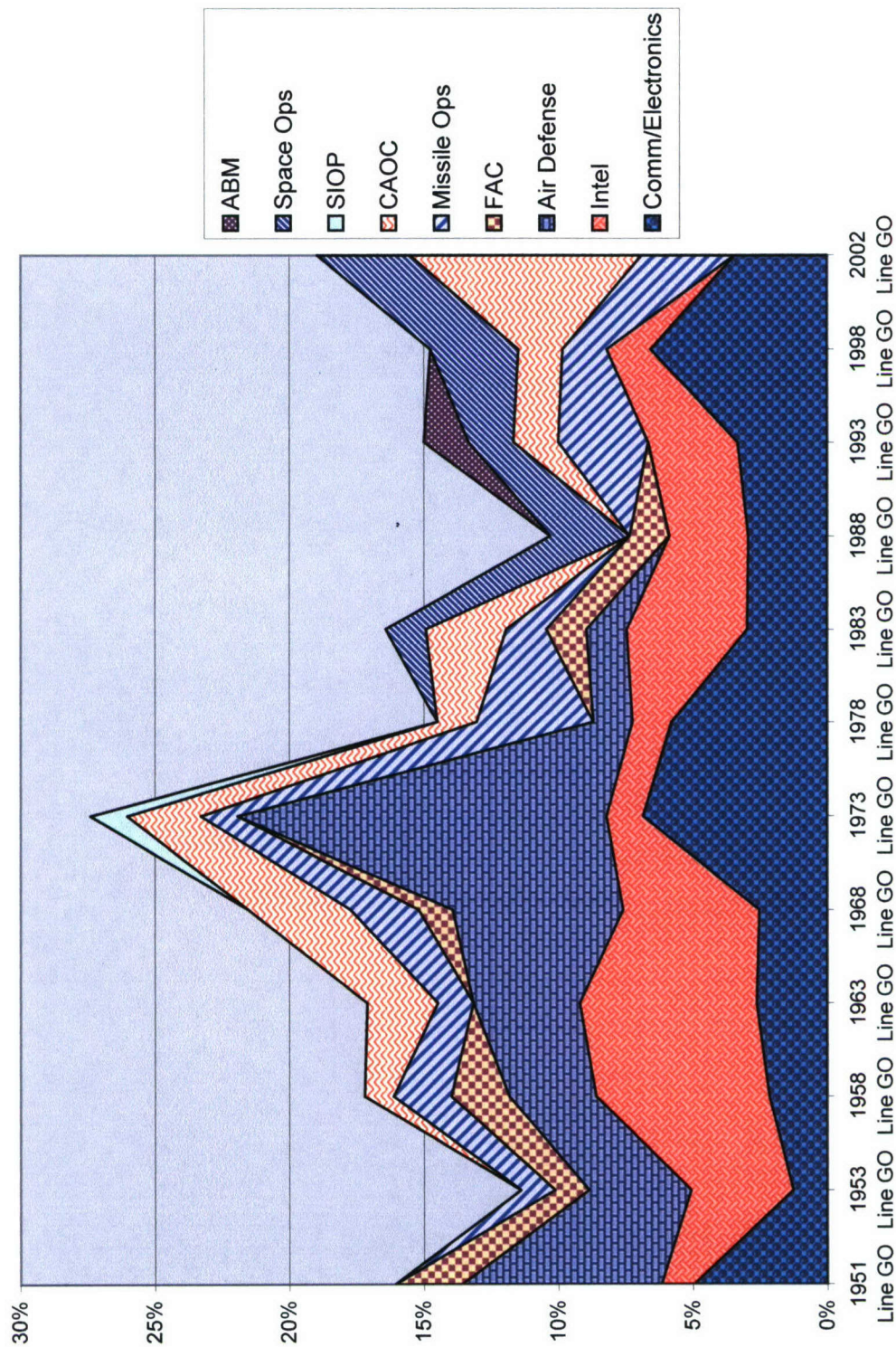
CAOC duty, on the other hand, has few of the traditional attributes of a heroic warrior. Flying is not involved, and in those cases where air battle managers perform CAOC functions onboard AWACS, ABCCC, or JSTARS aircraft, they are at best crewmembers, at worst passengers or baggage, but never pilots. CAOC workers are not in any particular danger, and the work, especially on the planning side is office-like. Although generating, distributing, and monitoring the implementation of air tasking orders and the other complementary orders and procedures is the backbone of modern tactical air operations, it smacks of routine and boredom in peacetime. Consequently, Tactical Air Control Centers and other CAOC-type entities tend to languish in peacetime. Up-and-coming officers apparently do not serve in such positions, or at least do not advertise the experience because it is not seen as positive unless it occurred during combat operations. CAOC tours are, however, visionary, and provide officers with the big-picture view of the most effective and efficient way to run combined, joint, or Air Force air and combat operations. The profession has recognized this, but the big boom in CAOC recognition and valuation in the 1990s does not show up for the

lieutenant colonels and below category by the 2002 general officer sample since those officers were not yet promoted to general officer rank. The CAOC tours are also not necessarily career-broadening since rated officers tend to serve in planning and operations, intelligence officers in intelligence billets, and logistics in logistics, and so on.

Chart 10-5 (GO Samples: Total Line General Officer Colonel First C4ISR Tours, by Percent) provides a quantitative look at the overall percentages per sample of line general officers with some C4ISR tour in the rank of colonel reported in their biographies as well as a nuanced look at the relative weighting between the various C4ISR fields. Overall, the graph starts with the 1951 sample and 16% of the line general officer biographies reporting a C4ISR tour as a colonel. The graph decreases to 11% in the 1953 sample, then generally climbs, peaking at 27% in 1973, followed by another decline, hitting a low of 10% in 1988, before climbing again and ending at 19% with the 2002 sample. As in the lieutenant colonel and below chart, some officers served communications/electronics tours in each sample. Similarly, intelligence tours are represented in each sample except for 2002. Air defense tours stop at the colonel level in 1983, although they continued to be reported through the 1988 sample in the lieutenant colonel and below category. However, at the colonel level, the percentage reporting air defense tours is higher, and in fact, the 1973 spike in colonel C4ISR tours is driven by air defense. This could have been a Vietnam drawdown effect. As the war ended, many officers may have been dumped into air defense billets. FAC tours play a



Chart 10-5: GO Samples: Total Line General Officer Colonel First C4ISR Tours by Percent



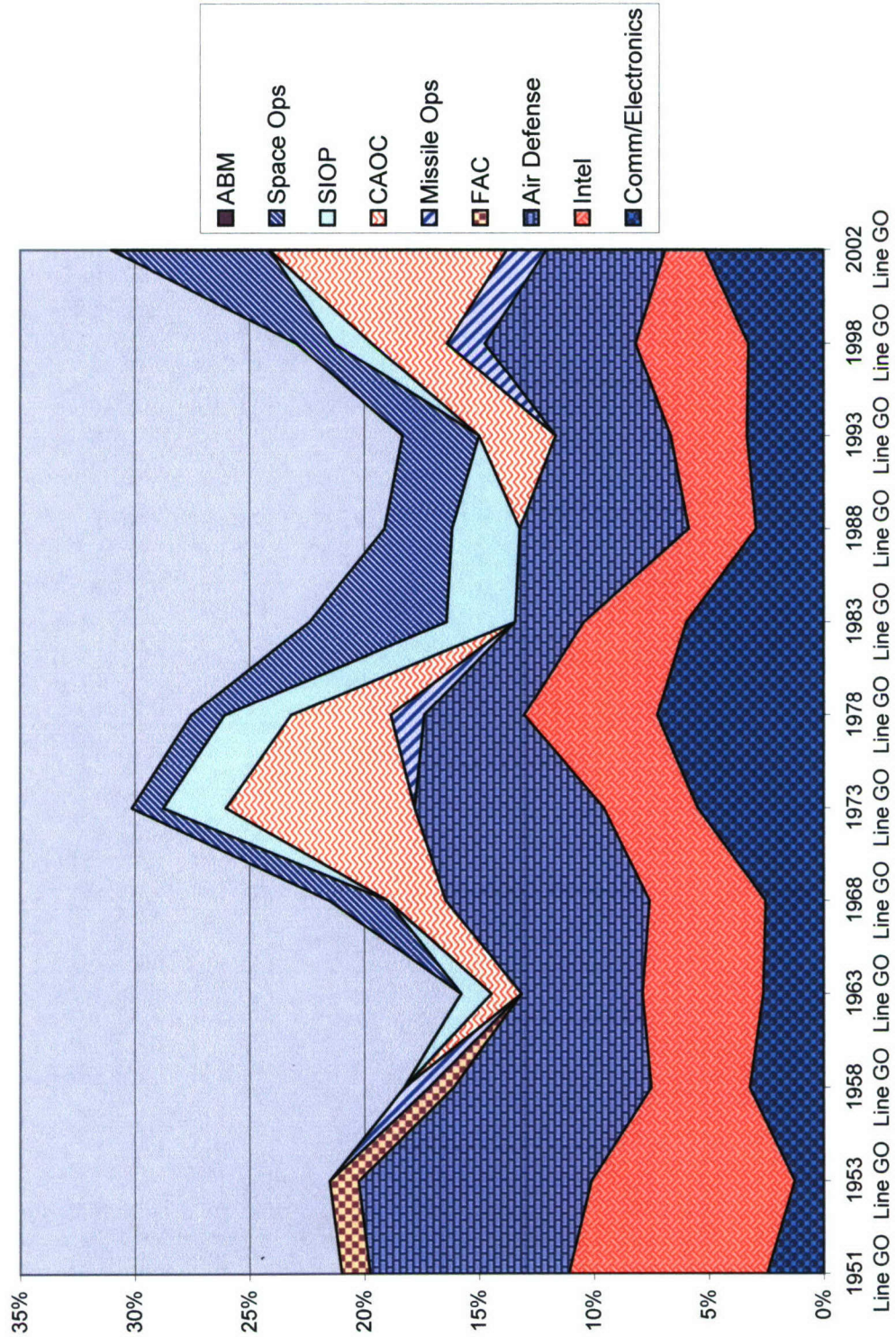
much smaller role at the colonel level since an entire FAC squadron typically consists of officers serving in the ranks of lieutenant colonel and below. The first missile operations tour at the colonel level is reported in 1953, 15 years earlier than for lieutenant colonel and below. This makes sense since no officers had missile experience when they first became operational, and promotable pilot officers were entrusted with positions of responsibility in the early missile units. Whereas the missile operations field stays represented in the lieutenant colonel and below category once it starts, it actually drops out of the colonel level category in the 1988 sample, but returns in the 1993 – 2002 samples. CAOC tours are much more evenly distributed among the samples at the colonel level than at the lieutenant colonel and below level, partly because colonel-level positions are positions of authority and consequently more prestigious than a run-of-the-mill junior officer CAOC position. In addition, the requirement to have rated colonels serving in the most important positions, combined with the culling inherent in the promotion process make it more likely to see up-and-coming colonels cycling through CAOC positions. Whereas the Vietnam era lieutenant colonel and below level CAOC experience reporting ended in 1988, the colonel CAOC tours end in 1983. And although there is no indication of an impact from the Gulf War and CAOC run operations in Southwest Asia and the Balkans in the 1990s at the lieutenant colonel and below level, it is clearly evident at the colonel level. It starts being reported in 1993, and increases to 9% in the 2002 sample. SIOP reporting only occurs once, in the 1973 sample, at the colonel level. The biographies first contain



reports on space operations tours in 1983 at the colonel level, i.e., five years or one sample later than at the lieutenant colonel and below level. However, it is reported continuously after 1983 at the colonel level. Air battle manager tours shrink from two at the lieutenant colonel and below level to just one at the colonel level.

General officer level experience in C4ISR-type billets is more consistent than that at the colonel, and lieutenant colonel and below levels. See Chart 10-6 (GO Samples: Total Line General-Officer-Level First C4ISR Tour by Percent). However, it still exhibits somewhat of a sinusoidal pattern, rising from 21% in the 1951 sample to 22% in the 1953 sample, before dropping to 16% in the 1962 sample, then climbing to 30% in the 1973 sample, then decreasing again, hitting a 1993 low of 18% before climbing again and ending at 31% in the 2002 sample. As is the case with the lieutenant colonel and below and colonel level data, the communications/electronic field is represented in each sample at the general officer level. Intelligence and air defense are represented in each sample for the first time, indicating that intelligence and air defense are still functions that require general officer supervision. However these fields are either not prestigious enough to warrant placing up-and-coming colonels and lower ranking officers in their ranks, or the officers serving in these fields are not promoted to general officer ranks. Furthermore, there is an implication that no particular prior experience is required for duty in intelligence or air defense positions at the general officer level. Otherwise, there would be more consistent reporting across the rank categories for these career fields.

Chart 10-6: GO Samples: Total Line General-Officer-Level First C4ISR Tour by Percent





Missile operations shows a slightly different situation, with relatively steady reporting of general officers who served in missile operations at the lieutenant colonel and below and colonel levels, but reports of missile operations jobs at the general officer level only occurring in three sporadic samples. Consequently, serving at least one tour in missile operations at the lieutenant colonel and below or colonel levels appears to be acceptable on the road to becoming a general officer. However, the samples indicate that the Air Force officer corps has no consistent need for general officers to serve in missile operations jobs. Since there are general officer level missile operations positions, other factors are involved. First of all, general officers who have served in missile operations positions at the general officer level may not find many follow-on jobs opportunities in Washington DC or as Major Command Commanders, the pool from which the samples are drawn. That would of course imply missile operations jobs at the general officer level are frequently dead ends. Second, the overlap between the space and missiles career fields means that some general officer's missile operations jobs may be masked because they may have served in a space operations job first. Finally, amalgamations between bomber and missile units under Strategic Air Command may have masked the missile aspects of some missile-related jobs.

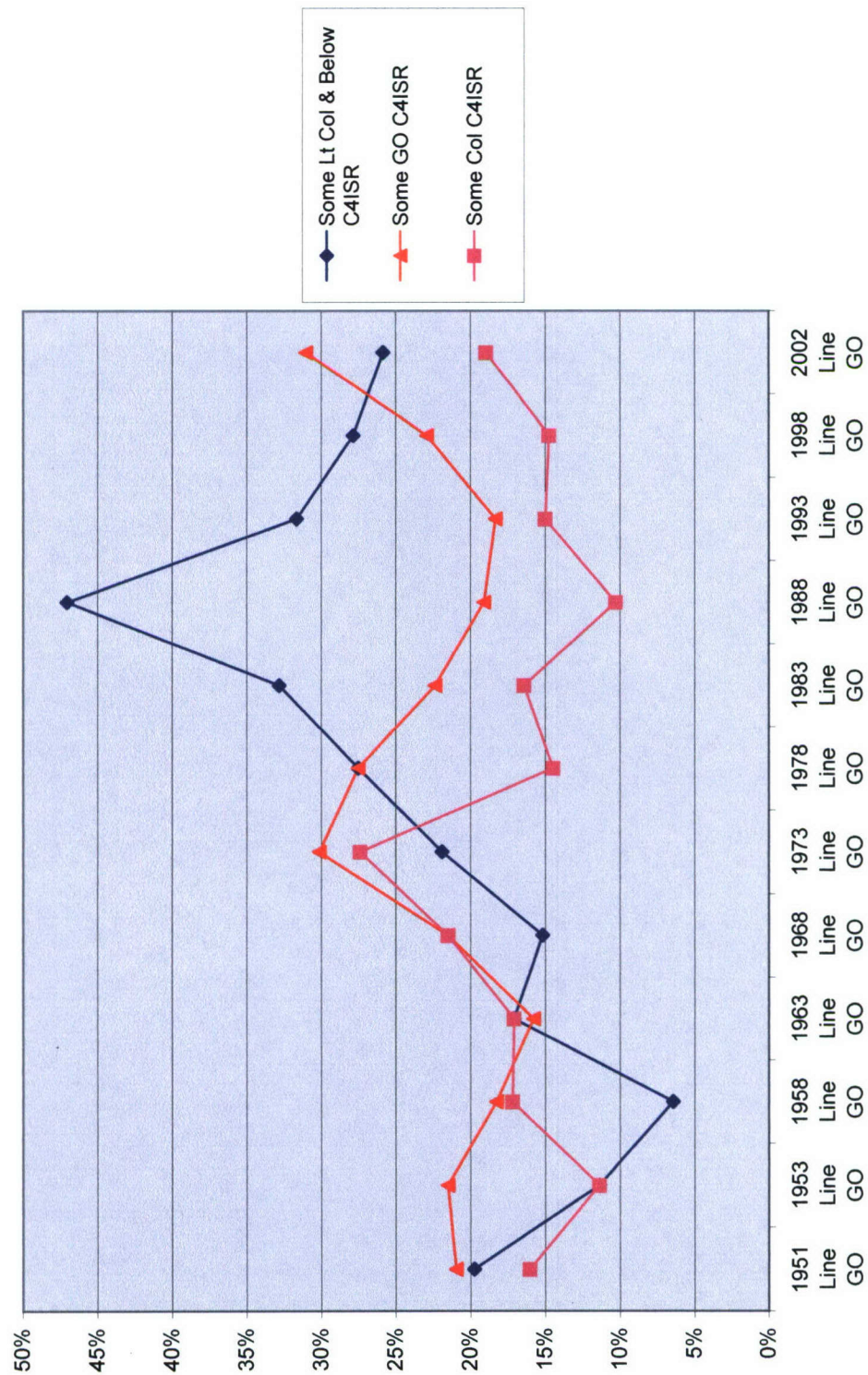
The reporting of general officer level CAOC tours is similar to the colonel level reporting in that there is a Vietnam era segment from the 1963 through 1978 samples of general officer level CAOC tours, as well as a post Desert Storm/Balkan Operations

effect starting in the 1993 sample and continuing through 2002 when 10% of the general officers reported a CAOC tour at the general officer level. The CAOC tours are also important for two further reasons. First, they indicate the importance of the CAOC concept in the Air Force's way of war. Officers in all three levels, from lieutenant colonel and below, colonel and general officer, are required to man CAOC positions for the CAOC concept to work. Second, officers who served in CAOC tours at lower ranks are being promoted to general officer ranks. Consequently, if one looks at the charts together, it is clear that some general officers in each sample from 1958 onwards have always had some CAOC experience, whether at the lieutenant colonel and below, colonel or general officer level.

Chart 10-7 (GO Samples: Total Line General Officer Comparison First C4ISR Tour as Lieutenant Colonel and Below, as Colonel, and as General Officer by Percent) provides a comparison of the curves for each of the three rank categories for C4ISR tours. The relationship between the curves appears to fall into two major divisions, centered around the 1973 and 1978 samples. From the 1951 through 1978 samples, the percent of line general officer biographies listing some type of C4ISR tour as a general officer or colonel tends to equal or exceed the percentage for the lieutenant colonel and below category. However, the lieutenant colonel and below curve dramatically exceeds both colonel level and general officer level C4ISR tour experience in the 1983 through 1993 samples. In fact, the percentage of line general officers with C4ISR tours in the lieutenant colonel and below category exceeds that of the colonel category from 1978



Chart 10-7: GO Samples: Total Line General Officer Comparison First C4ISR Tour as Lieutenant Colonel and Below, as Colonel and as General Officer, by Percent

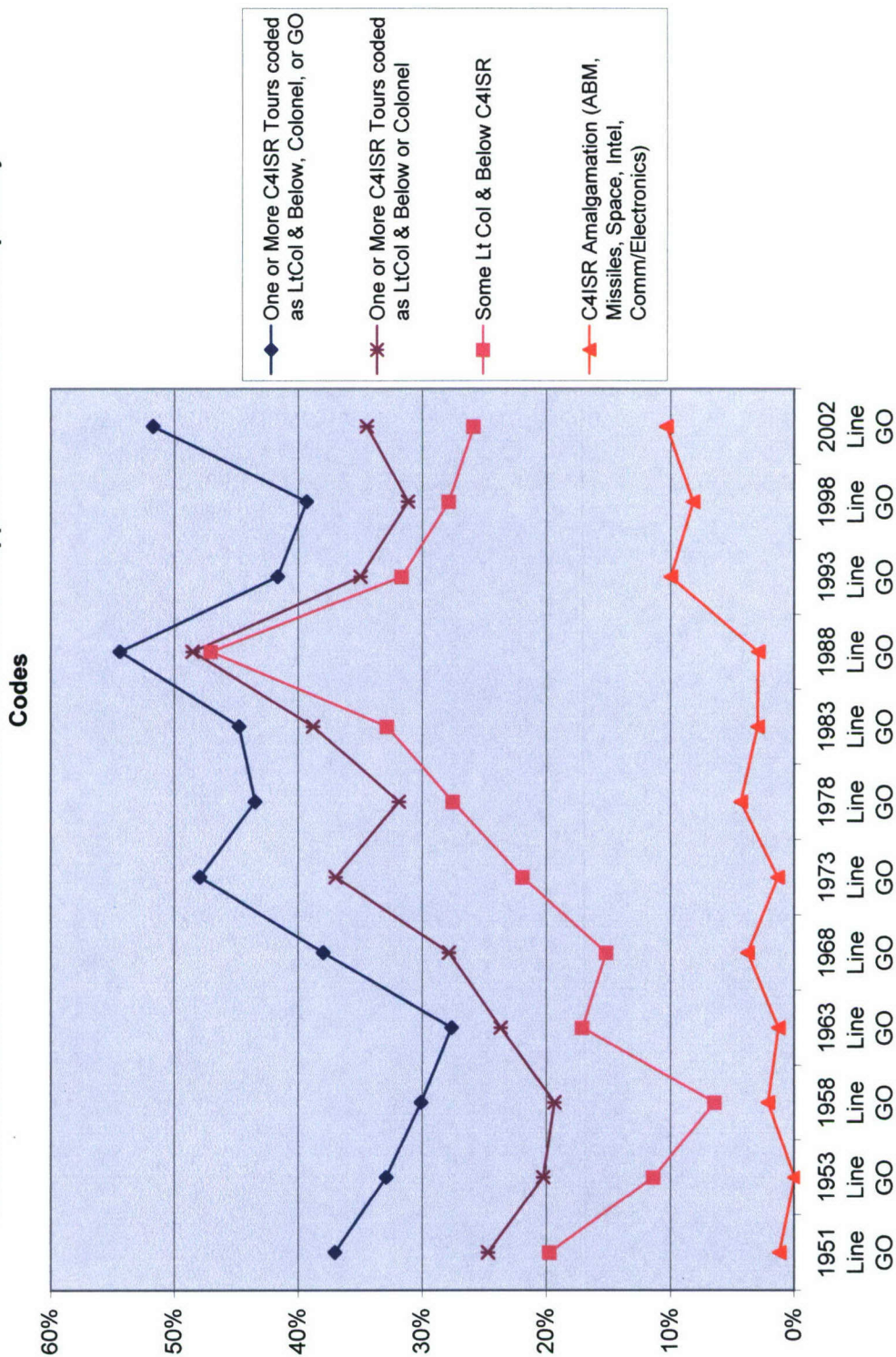


through 2002. This makes sense in that there are many more C4ISR billets below the rank of colonel. In addition, the impact of the Vietnam War on the numbers of officers serving as FACs and in CAOC billets at junior ranks is clear. However, the relationship of the graphs also potentially indicates an Air Force officer corps more willing to place up-and-coming officers into leadership positions over specialists in C4ISR fields from 1953 through 1973, and willingness of up-and-coming officers to serve in C4ISR fields in junior ranks from 1978 onwards. The exposure to C4ISR while serving in junior ranks presumably has a bigger impact on an officer's perspectives and career than a C4ISR tour later in his career.

Up to this point, the line general officer C4ISR tour data has been pooled at each rank category without respect to whether an officer has C4ISR experience in another rank category. Consequently, it is not clear what percentage of the line general officer corps actually has had one or more C4ISR tours. Chart 10-8 (GO Samples: Total Line General Officer With One or More C4ISR Tours Coded in Ranks of 2<sup>nd</sup> Lieutenant to General Versus General Officers With Apparent C4ISR Air Force Specialty Codes) provides this information. It starts with the C4ISR tour data provided above for the lieutenant colonel and below category. Then, at the colonel level, only general officer's with biography data indicating their very first C4ISR tour occurred at the rank of colonel are added to the lieutenant colonel and below data. Similarly, at the general officer level, only general officers whose biographies indicate no C4ISR tours until the rank of general officer are added to the colonel level data. The effect is three lines



Chart 10-8: GO Samples: Total Line General Officer With One or More C4ISR Tours Coded in Ranks of 2nd Lt to General Versus General Officers With Apparent C4ISR Air Force Specialty



showing the cumulative effect of adding these new officers with C4ISR tours at each level. The first and most obvious observation is that the lines do not overlap. Consequently, the same officers are not providing the C4ISR experience at each level. As the rank category increases, more new officers are added to the C4ISR experience base.

A second observation is that the percentage of general officers with at least one C4ISR tour in any rank from 2<sup>nd</sup> lieutenant to general officer has varied, in a somewhat upward sloping sinusoidal pattern from an initial value of 37% in 1951 to a low of 28% in 1963, followed by a climb, dip and further climb to a peak of 54% in 1988, another drop, then climb to a final reading of 52% in 2002. In terms of a rough order of magnitude, one-third to one-half of the general officers historically had at least one C4ISR tour in at least one rank category. A third observation is that the lieutenant colonel and below category has generally contributed the highest percentage of the cumulative total, especially in the 1988 sample. However, in the 1953 and 1958 samples, this is not the case, and in the 2002 sample, the percentage of general officers with C4ISR tours in the lieutenant colonel and below category continues to decline, while it increases slightly in the colonel level, and increases dramatically in the general officer level contribution to the cumulative total. However, since CAOC experience accounts for the increases in the colonel and general officer levels, it is reasonable to expect a lag similar to the 1973 to 1988 humps showing up in the lieutenant colonel and below category in the post 2002 future. By way of comparison, the bottom curve on the

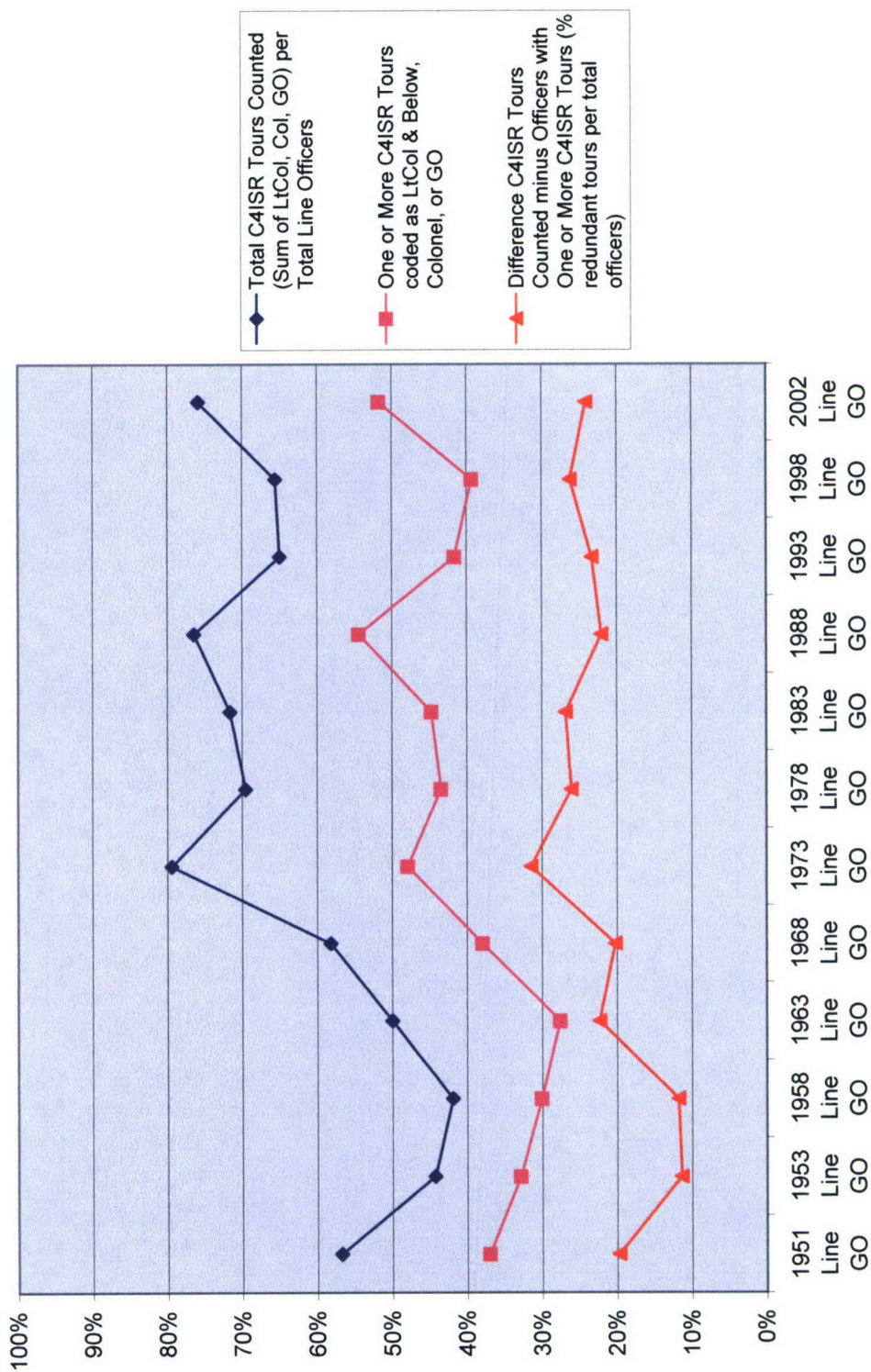


chart shows the percentage of total line general officers per sample with apparent Air Force Specialty Codes in the fields of the C4ISR amalgamation, which are air battle manager, missiles, space, intelligence, and communications/electronics. It is clear that these officers only comprise one-third to one-fourth of the officers with at least one C4ISR duty tour.

The last two charts (Charts 10-7 and 10-8) can also be compared head to head to get a look at the difference between the total number of C4ISR tours counted without respect to whether an officer served in C4ISR duty in more than one rank level, and the total number of officers with one or more C4ISR tours. In the first case, the percentages of the total number of tours at the lieutenant colonel and below, colonel, and general officer levels are simply added together. In the second, only new officers with no prior C4ISR tours are added at the colonel and general officer level. In each case, however, only the first C4ISR tour in a rank category is counted.

Chart 10-9 (GO Samples: Total Line General Officer Comparison of Sum of C4ISR Tours Counted (Lt Col, Col, GO) versus Officers with One or More C4ISR Tours in Ranks of 2<sup>nd</sup> Lt to General) presents this data. The top curve represents the percentage of the sum of all C4ISR tours counted at the lieutenant colonel and below, colonel and general officer levels divided by the total line general officers. This potentially provides an inflated rate since some officers may have actually served in C4ISR jobs at different levels and other officers may have never served in a C4ISR tour. The middle curve represents the percentage of C4ISR jobs, counting only the first

**Chart 10-9: GO Samples: Total Line General Officer Comparison of Sum of C4ISR Tours Counted (Lt Col, Col, GO) versus Officers with One or More C4ISR Tours in Ranks of 2nd Lt to General**

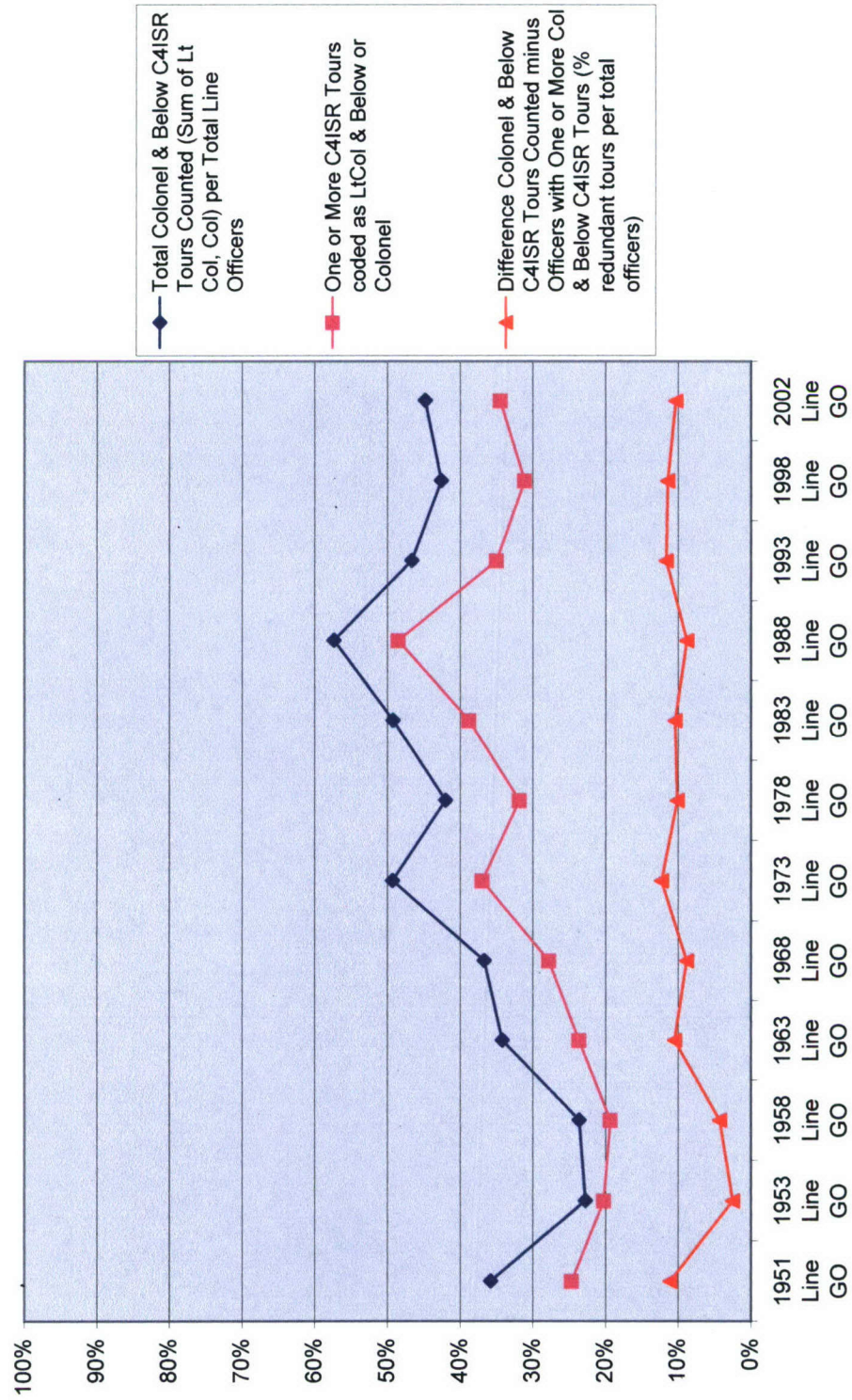




C4ISR job at any level per individual officer, divided by the total line general officers. In other words, it is the percentage of officers who actually served one or more C4ISR tours. The bottom curve is the difference between the two top curves. This provides the percentage of C4ISR tours that were served by officers who had already served at least one C4ISR tour in a different rank level divided by the total line general officers. In the 2002 sample for example, the sum of the C4ISR tours counted at all three levels and divided by the total line general officers resulted in the figure of 0.76 C4ISR tours per officer. However, only 0.52 C4ISR tours per officer were accounted for when each individual officer was only counted once for all of his C4ISR tours. The resulting .24 C4ISR tours per officer represents the multiple C4ISR tours at different rank levels. However, some officers may have served in two levels, others may have served in all three and there is no attempt to distinguish between them. Overall, the curve of the difference, which indicates the multiple C4ISR tours, starts off at .20 in the 1951 sample, decreases to .11 in the 1953 sample, then climbs erratically to a peak of .32 in 1973, after which it declines and then steadies with fluctuations around the .25 level through the 2002 sample. Consequently, the end of the curve at the 2002 sample indicates that of the general officers that have served a C4ISR tour (52%), roughly one in four has served C4ISR tours in multiple rank levels.

Chart 10-10 (GO Samples: Total Line General Officer Comparison of Sum of C4ISR Tours Counted (Lt Col, Col) versus Officers with One or More C4ISR Tours in Ranks of 2<sup>nd</sup> Lt to Colonel) provides the same type of information, but excludes the

**Chart 10-10: GO Samples: Total Line General Officer Comparison Sum of C4ISR Tours Counted (LtCol, Col) versus Officers with One or More C4ISR Tours Coded in Ranks of 2nd Lt to Colonel**



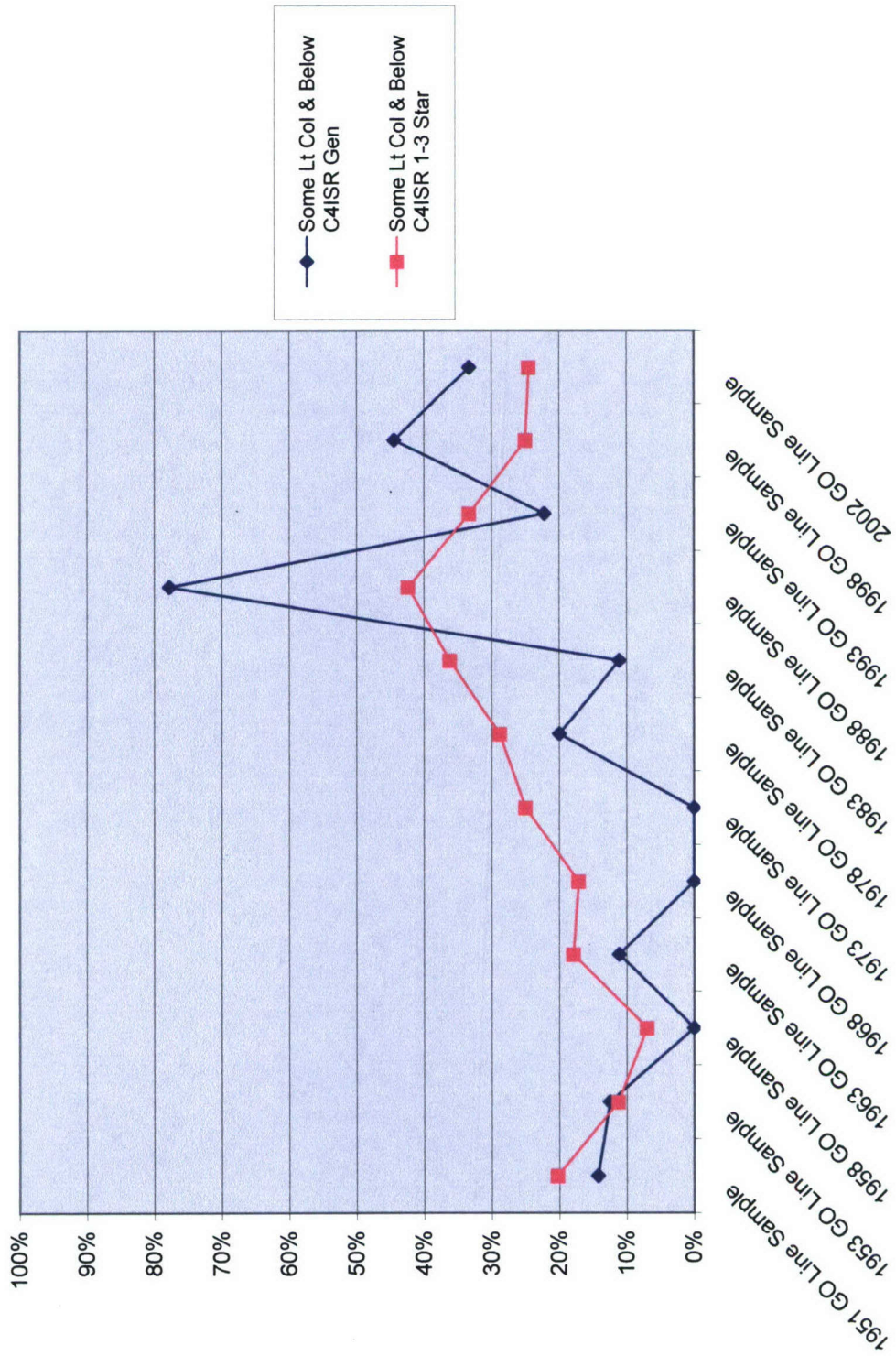


C4ISR tours reported at the general officer level. The major difference between the two charts is that the curve showing the difference between the percentage of total C4ISR tours counted in the colonel and below levels and the percentage of officers with one or more C4ISR tours in the colonel and below rank levels fluctuates around the 10% level, except for the 1953 and 1958 samples, instead of the 25% level in the earlier chart. The end result is that as the rank level increases, so does the percentage of line general officers with at least one C4ISR tour who have served multiple level C4ISR tours. In other words, as the C4ISR duty tours at the general officer level are added, a higher percentage of the officers were serving in C4ISR billets for the second or third time.

#### Comparison of 4-Star versus 1-3 Star General Officers *vis a vis* C4ISR Experience

Chart 10-11 (GO Samples: General versus 1-3 Star General Officers – Some Lt Col & Below C4ISR) shows the percentages of 4-star and 1-3 star general officers with at least one C4ISR-type tour in the ranks of lieutenant colonel and below. The 1-3 star data shows an initial decrease in the percentage of 1-3 star line general officers with one or more C4ISR-type tours in the ranks of lieutenant colonel and below from 20% in the 1951 sample down to 7% in the 1958 sample. This captures the departure of the general officers with extensive pre-World War II experience, which often included heavier amounts of experience in billets not directly related to flying. From 1958 through 1988 the trend is generally climbing, reaching 42% in 1988, followed by a decrease to 25% in 1998, and 24% in 2002. The 4-star graph shows an erratic pattern overall, marked by a perceptible overall increase from 1973 through 2002, with a tremendous spike to 78%

Chart 10-11: GO Samples: General versus 1-3 Star General Officers -- Some Lt Col & Below C4ISR

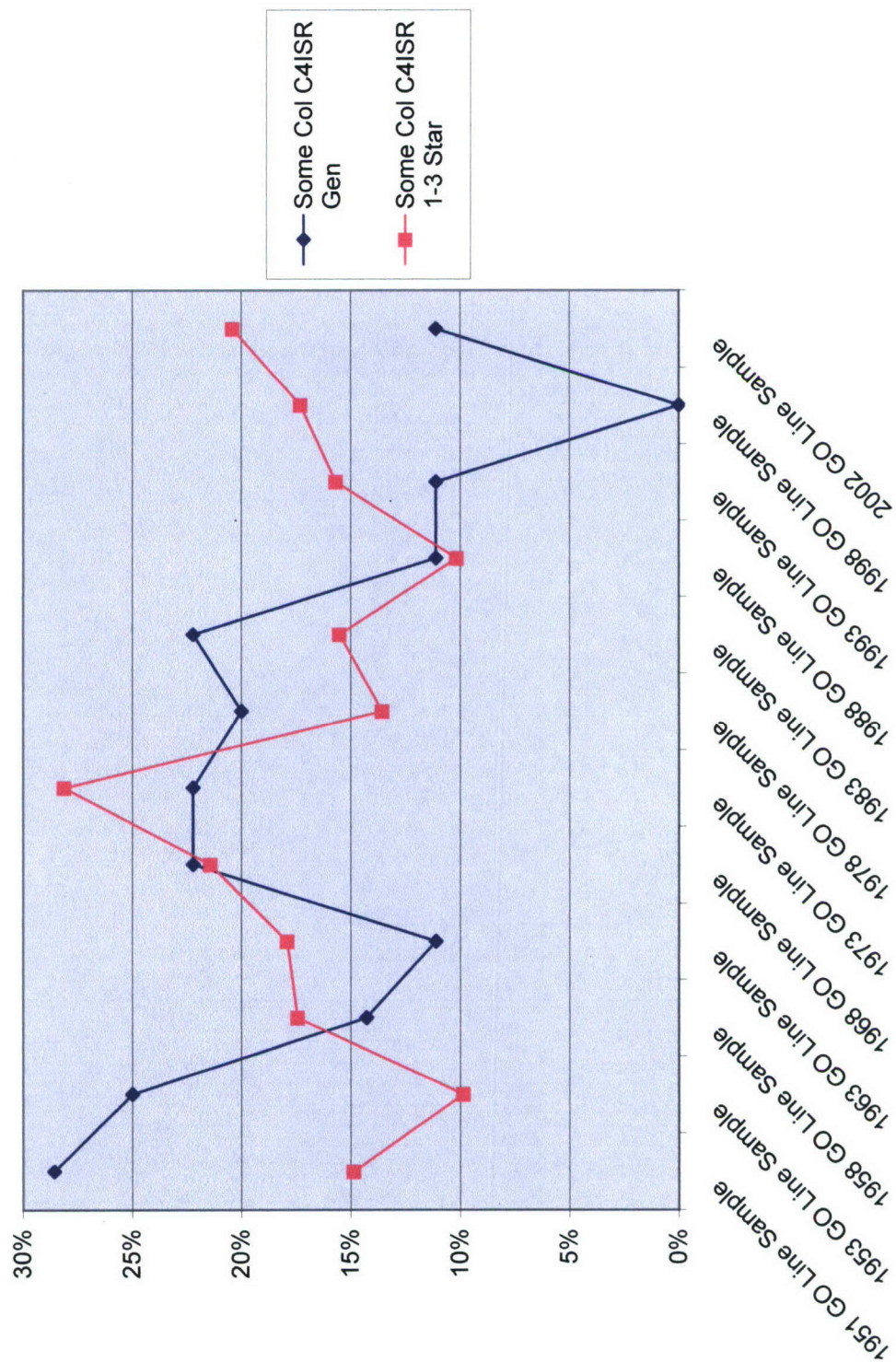




in the 1988 sample. The 1988 spike is noteworthy not only because of its quantity, but also because of the diversity of C4ISR tours exhibited. In the 1988 sample, 4-star general officers reported C4ISR tours at the lieutenant colonel and below level in space operations, missile operations, CAOC, FAC, and air defense. In the 1-3 star general officer samples of C4ISR experience in the ranks of lieutenant colonel and below, all C4ISR tours are represented at least once, and many continuously across all samples from 1951 through 2002. The 1-3 star data is largely representative of the total general officer data provided above.

Chart 10-12 (GO Samples: General versus 1-3 Star General Officers – Some Colonel C4ISR) provides a comparison of the graphs for 4-star and 1-3 star general officers reporting some C4ISR tour in the rank of colonel without respect to whether the officer served in a C4ISR tour while in the lower officer ranks. Although the 4-star general curve is somewhat erratic, more officers served in C4ISR tours as colonels than as lieutenant colonels from the 1951 through 1958 samples, and again in the 1968, 1973, and 1983 samples, but more officers reported serving C4ISR tours in the lieutenant colonel and below ranks in the 1988 through 2002 samples. Consequently, there is some evidence of a shift in the 4-star ranks towards more C4ISR tours in the lieutenant colonel and below ranks over time. The 1-3 star general officer graph provides data on a similar trend. Whereas the relative percentage of 1-3 star general officers who reported serving in C4ISR tours as a colonel or at the lieutenant colonel and below ranks varies from 1951 through 1973, from the 1978 sample onwards more

**Chart 10-12: GO Samples: General versus 1-3 Star General Officers -- Some Colonel C4ISR**

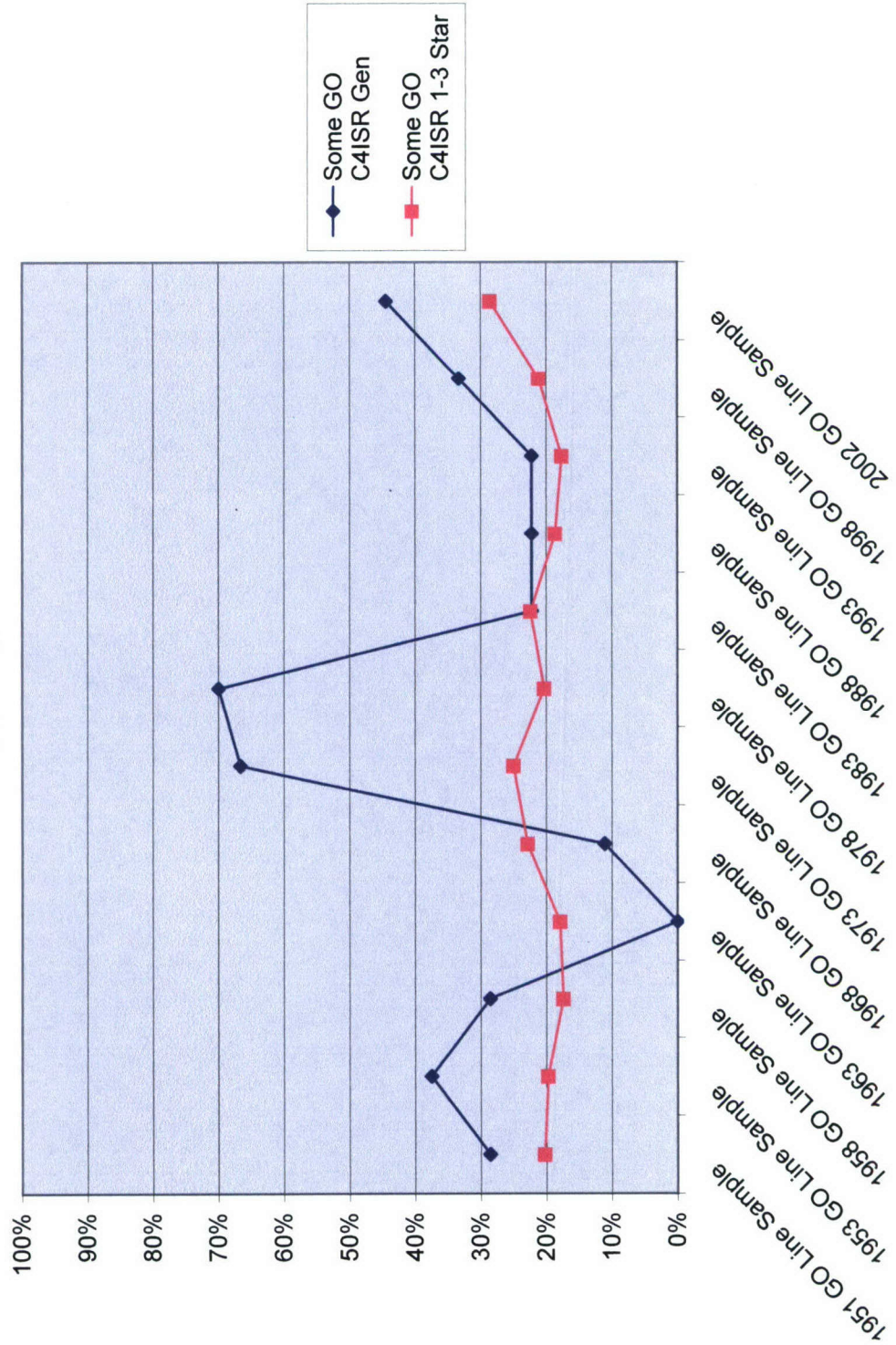




1-3 star general officers report serving C4ISR tours as lieutenant colonels and below than as colonels. However, the graph for colonel C4ISR tours has been climbing since the 1988 sample, and the graph for lieutenant colonel and below C4ISR assignments has decreased since the 1988 sample, so this trend may be changing again. A further difference between the graphs for the 4-star general C4ISR tours at the colonel and lieutenant colonel and below levels is that only the 1998 sample produced a time when no 4-star generals reported a colonel C4ISR tour, whereas no 4-star generals reported lieutenant colonel and below C4ISR tours in 1958, 1968, and 1973. This could be further evidence of the trend towards more lieutenant colonel and below C4ISR-type tours.

Chart 10-13 (GO Samples: General versus 1-3 Star General Officers—Some GO C4ISR) presents graphs of the percentages of 4-star and 1-3 star general officers reporting a general officer level C4ISR tour, regardless of C4ISR experience in the ranks of colonel and lieutenant colonel and below. The 4-star curve is quite erratic as usual, but it is noteworthy that over half of the 4-star generals sampled in 1973 and 1978 served at least one C4ISR tour at the general officer level. Furthermore, the trend from the 1993 to the 2002 samples is clearly upward. The 1-3 star general officer curve is remarkably stable by comparison, hovering around the 20% mark from the 1951 through 1998 samples, with a sudden climb to 29% in 2002. An explanation for the consistency is that the general officer level C4ISR jobs by definition require general officers to fill, whereas there is no prescribed path to reach general officer ranks and no

**Chart 10-13: GO Samples: General versus 1-3 Star General Officers -- Some GO C4ISR**





mandatory or desired quotas to allocate so many general officer slots to particular non-pilot career fields. Consequently, one might expect a somewhat random sampling of tour experiences from all the various Air Force officer specialties in the colonel level and lieutenant colonel and below samples.

From the qualitative perspective, no 4-star general officer served in a communications/electronics billet at the general officer level. This is consistent with the colonel level and lieutenant colonel and below results for communications/electronics billets, and indicates that tours in communications/electronics appear to be seen by the profession as being more specialist-oriented since out of all the samples across the three levels, there is only one 4-star report of a communications/electronics tour, and that occurred at the colonel level. Communications and electronics have always been important to the Air Force, just not at the 4-star level. In fact, the communications/electronics field is the only one in which at least one 1-3 star general officer reported serving in communications/electronics at all three levels in each sample. Furthermore, the Air Force Communications Service/Command, which rated the status of a major command, was only commanded by major generals (2-stars); most major commands are commanded by 4-star general officers. Intelligence appears to have moved to a similar bailiwick across the timeline of samples. The samples indicate that one 4-star general officer reported serving in an intelligence-type billet at the general officer level in 1951, 1953, 1958 and 1978. This decline in intelligence experience is consistent with the

three (1951, 1953, 1963 samples) 4-star intelligence tours reported at the lieutenant colonel and below level. No 4-star general officers reported colonel level intelligence tours. At the 1-3 star general officer level, intelligence is represented in every 1-3 star sample at the lieutenant colonel and below and colonel levels except 2002.

Furthermore, one or more 1-3 star general officers reported serving in intelligence-type positions at the general officer level in each sample from 1951 to 2002. However, it does not appear to be a desired or required characteristic at the 4-star level, perhaps at least partly because as in the case of communications, there is no 4-star Air Force intelligence billet.

Air battle managers were noticeably absent from the 4-star general officer samples at any level, and only present in the 1-3 star general officer samples at the colonel and lieutenant colonel and below levels. The lack of air battle manager tours at the general officer level is misleading from the perspective that many of the C4ISR categories such as air defense and CAOC are air battle manager functions, so many general officers perform air battle manager tasks and have performed them at lower ranks. However, they are not air battle managers. On the other hand, the fact that only two air battle managers show up across all of the samples, and these two have switched career fields by the time they make general officer rank, indicates an overall undervaluation of the air battle manager career field by the profession at large. The functionality is required at all three levels, but the career field that trains officers to provide that functionality from the rank of 2<sup>nd</sup> lieutenant onwards are not typically



promoted to the general officer ranks, and not used in the air battle manager functionality when promoted. This is a result of the profession's affinity for filling senior positions with responsibility over flying operations with pilots. Air battle managers appear to fall into the category of technical specialists that do not warrant general officer billets.

With respect to missile operations, 2002 was the first sample in which a 4-star general officer reported a tour in missile operations at the general officer level. Of course, that same general in the 2002 sample also accounts for one of the two 4-star general officer reports of colonel level service in missile operations as well as one of the two reports of missile operations at the lieutenant colonel and below level. The other colonel level report occurred in 1978, and the lieutenant colonel and below level report in 1988. Although the first general officer report of missile operator experience occurred in the 1953 sample at the colonel level and the 1-3 star general officers reported at least one colonel level missile operations tour in every sample after 1953 except 1988, the first 4-star general officer with general officer level service in missile operations did not occur until 2002.<sup>313</sup> Space operations, however, was first reported in the 1968 sample at the general officer level in the 1-3 star group. The first 4-star to report space operations experience at the general officer level followed in the 1978 sample, which is also when the first 1-3 star general officer reported serving in space

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<sup>313</sup> The first general officer level missile operations tour was reported in the 1958 1-3 star general officer level sample.

operations at the lieutenant colonel and below level. Only one 4-star general officer ever reported a space operations tour in the lieutenant colonel and below ranks (1988 sample). The 1-3 star general officers first reported an officer who served a colonel level space operations tour in 1983, and continued reporting officers with colonel level experience through 2002. Four-star general officers did not report any colonel level space tours in any samples.

The juxtaposition of the almost 40 years between the first sample mentioning missile operations and the first 4-star general officer level missile operations report and the 10 years between the first space operations report and the first 4-star general officer level space operations report, indicates that the importance of space operations was recognized more quickly and considered a more important experience for 4-star generals. Although that may indeed be the case, structural factors played a role in the paths of space and missile operations. The Air Force's decision to initially treat surface-to-surface missiles as a sort of unmanned bomber was important in terms of jurisdictional disputes with the other services. Calling the missiles unmanned bombers, however distasteful to pilots, meant that the public could see that bombers, whether manned or unmanned, belonged to the Air Force. Unmanned bombers provided another tool for deep, strategic air attacks on the enemy homeland, and the Air Force officer corps strove for a monopoly over this jurisdiction, which, after all, was the founding premise of the independent Air Force. Although the term *missiles* might have been construed as supporting space activities, it was not clear that the Air Force could simply



claim space as its own jurisdiction. Furthermore, it was extremely important to discredit any linkage between ICBMs and surface-to-surface missiles, which could be cast in terms of artillery, which naturally belonged to the Army. It would be dangerous to allow the Army to compete with the Air Force for the strategic bombing mission. Consequently, the Air Force integrated the strategic missile force into Strategic Air Command. This of course meant that at some level missile units would be amalgamated with flying units and at that level, if not before, missiliers could no longer command. After all, the ICBM versions of unmanned bombers were not flown by pilots; they were simply launched.

The warning aspects of space operations functionally tied into air defense. However, the Air Force officer corps' air defense jurisdiction was of declining importance after it became clear that Soviet ICBMs, not bombers, were the long-term threat to the continental US. However, it was not in the Air Force officer corps' interest to publicly recognize this new jurisdiction and compete to fill it. Instead, the Air Force officer corps sought to create the impression that there was no new jurisdiction up for grabs. Rather, minor modifications were being made to an existing jurisdiction. Consequently, the Air Force was able to shift resources from the diminishing air defense jurisdiction into the new and expanding space operations jurisdiction under the guise of the same Aerospace Defense Command and NORAD structures, at least partly because of the overlapping functionality. After all, the Air Force officer corps was simply increasing the altitude of air defense by changing the command's name from *Air*

to *Aerospace* Defense Command. At the same time, by separating its space and missile activities into at least three parts, with ICBMs under Strategic Air Command, space and missile development and acquisitions under Air Force Systems Command, and space operations under Aerospace Defense Command (later Air Force Space Command), the Air Force officer corps also prevented the emergence of an integrated and potentially independent space and missile service.

The sample data captures the overall decline in the importance of air defense in the colonel and below ranks. At the lieutenant colonel and below level, 1-3 star general officers report one or more officers in the 1951 through 1983 samples, but only one 4-star general officer reports such a tour (1988 sample). At the colonel level, one or more 1-3 star general officers report an air defense tour in the 1951 through 1978 samples, but 4-star general officers report sporadically 1951 through 1983, with no 4-star general officers reporting any air defense colonel level tours in 1958, 1968 and 1978. As the active duty command and control aspects of air defense consolidated in the 1980s and then those below NORAD headquarters shifted to the Air National Guard in the 1990s, opportunities for colonel and below air defense positions disappeared. At the general officer level, at least one 1-3 star general officer reported an air defense tour in each sample, but 4-star reporting is more sporadic and no air defense tours are reported for seven out of the 12 samples, but three 4-star general officers reported general officer level air defense tours in the 1988 sample and none in 2002. After 1980, it is difficult to distinguish in the samples between general officer level space and air defense tours



because of the overlap between NORAD and Air Force Space Command, with some biographies emphasizing or placing NORAD, which is air defense, first, and other biographies placing space first. The inclusion of the ICBM force under Air Force Space Command after Strategic Air Command was dissolved further complicates the distinctions between space, air defense and missile operations. Although logical in many ways, the consolidation of space, missiles, and part of the remaining Air Force air defense activities into Air Force Space Command combines several aspects of C4ISR that could potentially seek independence from the Air Force and become an independent service with a functional monopoly on C4ISR-type issues if the Air Force were to remain tied to piloted flight as its prime *raison d'être*.

Although 1-3 star general officers reported SIOP tours at the lieutenant colonel and below, colonel, and general officer levels, the sampled 4-star general officers only reported SIOP experience in the general officer ranks, and only for the period of the 1973 through 1988 samples. Furthermore, this was typically included as part of the job description for commanding Strategic Air Command. Although there may have been some underreporting due to security concerns, it is interesting that so few general officers overall reported working in billets that developed the SIOP since the SIOP after all governed the actions of all the bomber, tanker and missile alert crews, and served as the basis for organizing and directing Strategic Air Command's combat forces for so long.

The 4-star general officer reporting of CAOC-type duty is very light at the lieutenant colonel and below and colonel levels, but heavier at the general officer level. For example, only one 4-star general officer reported duty in a CAOC at the lieutenant colonel and below level (1988 sample), and just two reported CAOC-type tours at the colonel level (1968 and 1993 samples). However, 1-3 star general officer reporting of CAOC experience at the lieutenant colonel and below level stretches over four samples, from 1973 through 1988, with a climb to its peak of 9% in 1983. The 1-3 star general officers report colonel level CAOC-type tours from 1958 through 1983, with a second wave starting in 1998, which jumped from the one or two officer level to five in 2002. CAOC service at the general officer level is a different story though, with 45% of the 4-star general officer 1973 sample, and 30% of the 1978 sample reporting CAOC duty as general officers in Vietnam. The four 4-star generals in the 1973 sample and the three in the 1978 exceed the one to two 1-3 star general officers who reported CAOC-type duty at the general officer level in the 1963, 1968 and 1973 samples, indicating that combat CAOC experience is valued in the 4-star general ranks. The lack of any peacetime CAOC tours indicates that such roles were not valued or not really available in peacetime operations. In either case, however, the CAOC function was incredibly important during wartime. The same story is evident in the 1993 through 2002 samples, where one 4-star general and one 1-3 star general reported CAOC-type duty in the 1993 sample, and the number of 1-3 star generals reporting CAOC duty increased each succeeding sample. No 4-star general officer reported CAOC duty in the 1998 sample,



but two reported it in the 2002 sample. One can expect positive slopes in CAOC reporting in the future since the Air Force began to stress the importance of the CAOC as a *weapons system* in the 1990s and because Desert Storm and successive Air Force operations in the Southwest Asia and the Balkans have been run out of CAOCs. Consequently, there are both more opportunities for CAOC-type duty and more recognition of its importance.

The FAC-factor is of particular note because of its relatively high level of reporting across the samples in terms of both number of samples and number of 4-star generals reporting FAC-type experience in at least one of the three levels. For example, at the lieutenant colonel and below level, 4-star generals reported one to four FAC-type tours per year in the 1978 through 2002 samples. The duration of the effect across six samples, covers an almost 30 year period, and up to four (44% in 1998) of the 4-star generals reported FAC-type tours in one sample. Colonel level FAC and liaison tours were reported in the 1951, 1953, 1958, 1968, 1983 and 1988 samples, tying FAC-type tours with air defense as the most popular colonel level C4ISR-type tours for 4-star generals. Four-star general officers also reported FAC or liaison tours at the general officer level in the 1951, 1953 and 1958 samples. There are no 1-3 star general officer reports of FAC-type duty at the general officer level. Heroic warrior aspects are inherent in this particular C4ISR-type tour and might therefore explain its dominant position when looking at C4ISR experience in the Air Force 4-star general officer world. Nevertheless, serving as a FAC at the confluence of the tactical fighter and the

command and control spheres certainly gave these officers a perspective on the complexity of air warfare far beyond that seen by their strictly fighter or bomber pilot peers. The officers were a vital part of the command and control system. Furthermore, it is remarkable that 44% of the 1998 4-star sample served as FACs at the lieutenant colonel and below level since FAC aircraft accounted at any given time for only 10-25% of the total Air Force aircraft in theater during the Vietnam War.

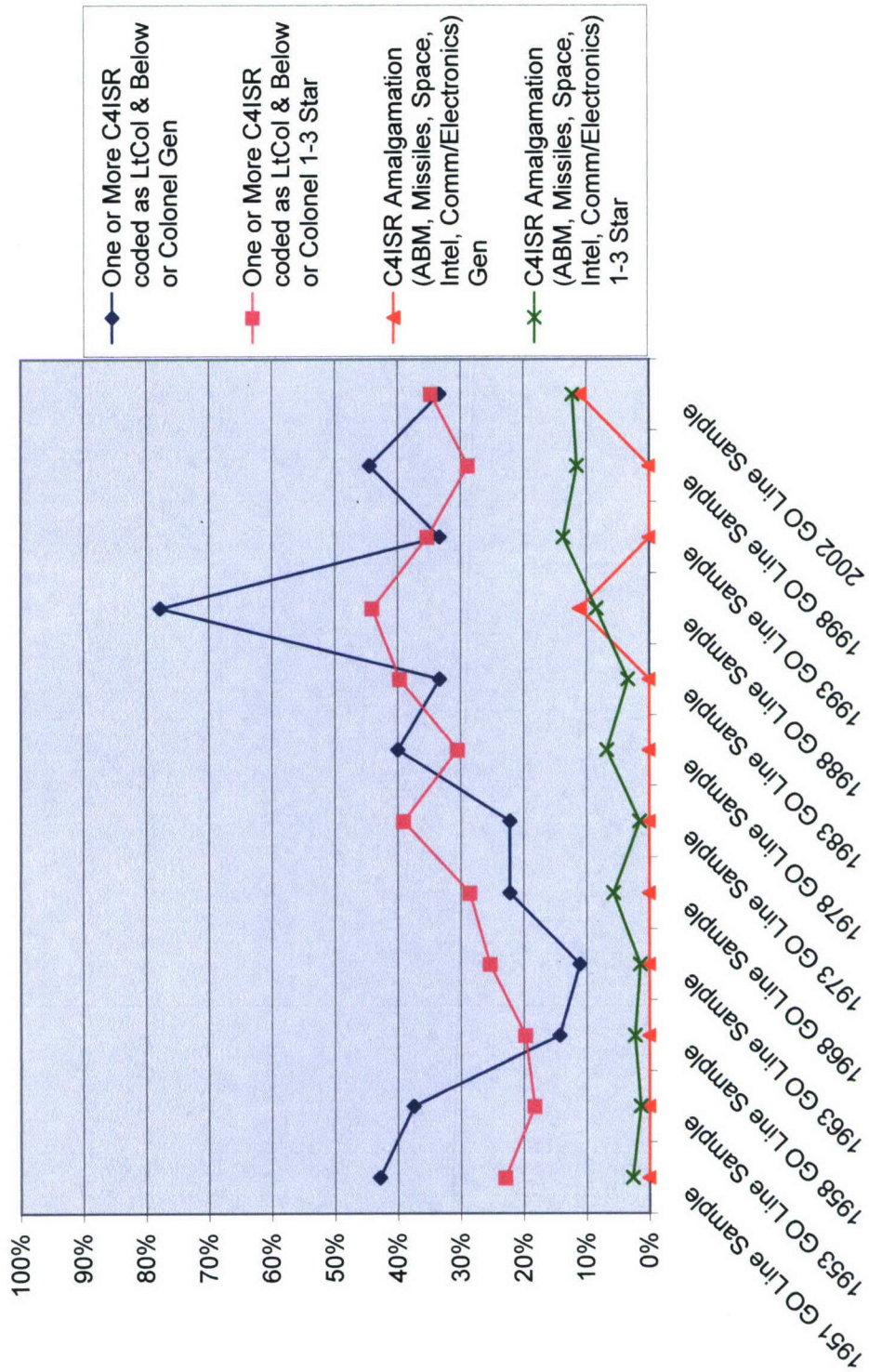
The apparent importance afforded this FAC experience in the 4-star ranks is further supported by the fact that the first post-Vietnam lieutenant colonel and below FACs appeared simultaneously in the 4-star and 1-3 star 1978 samples, which indicates that FAC experience was rewarded and not a hindrance to relatively quick promotion to 4-star rank. In addition, lieutenant colonel and below FAC experience in the 1-3 star general officers peaked earlier at 24% in the 1988 sample, but did not peak for another ten years at the 4-star level, so the percentage of 4-star FACs continued to increase as the selection pool decreased. The 1-3 star generals reported only two (1951 and 1958 samples) occurrences of colonel level FAC or liaison tours, which stands in marked contrast to the six reports by 4-star generals. This is noteworthy because the colonel level FAC tours tend to be liaison duties or command over a FAC unit, not actually flying an aircraft on the front lines, coordinating targets while being shot at. Consequently, the colonel level FAC tours are less heroic warrior than the lieutenant colonel tours. However, they are still are considered worthwhile enough to have done



and to include in biographies. The same holds true for the general officer level FAC-type tours.

When only data from general officers whose first C4ISR tour occurred while in the rank of colonel is added to the overall lieutenant colonel and below C4ISR chart, the result is Chart 10-14 (GO Samples: General versus 1-3 Star General Officers – One or More C4ISR-Coded Tours per Individual Officer as LtCol & Below or Colonel versus Initial C4ISR AFSC GOs). The dramatic peak created by the 1988 4-star general officer sample data continues to dominate the graphs. However, the addition of the colonel data shrinks the range of the percentages of the 1-3 star general officer data somewhat, with the curve now mainly between the 20% and 40% marks, whereas it previously ranged from below 10% to over 40%. The minimum for the 4-star general graph also climbs to 10%, but the percentage of 4-star generals with some type of C4ISR tour in the 1951 sample climbs to 43%, and 38% in the 1953 sample before dropping down into the teens with the 1958 and 1963 sample data. This indicates a bigger percentage of 4-star general officers whose first C4ISR experience came at the colonel rank in the early 1950s. For comparison purposes, the chart also provides the curves for the initial Air Force Specialty Code C4ISR general officer amalgamation for 4-star and 1-3 star general officers. These show that the growth in officers promoted to general officer who started out in C4ISR career fields has been primarily in the 1-3 star general officer ranks. Only two officers, one in the 1988 sample and one in the 2002

**Chart 10-14: GO Samples: General versus 1-3 Star General Officers -- One or More C4ISR-Coded Tours per Individual Officer as LtCol & Below or Colonel versus Initial C4ISR AFSC GOs**

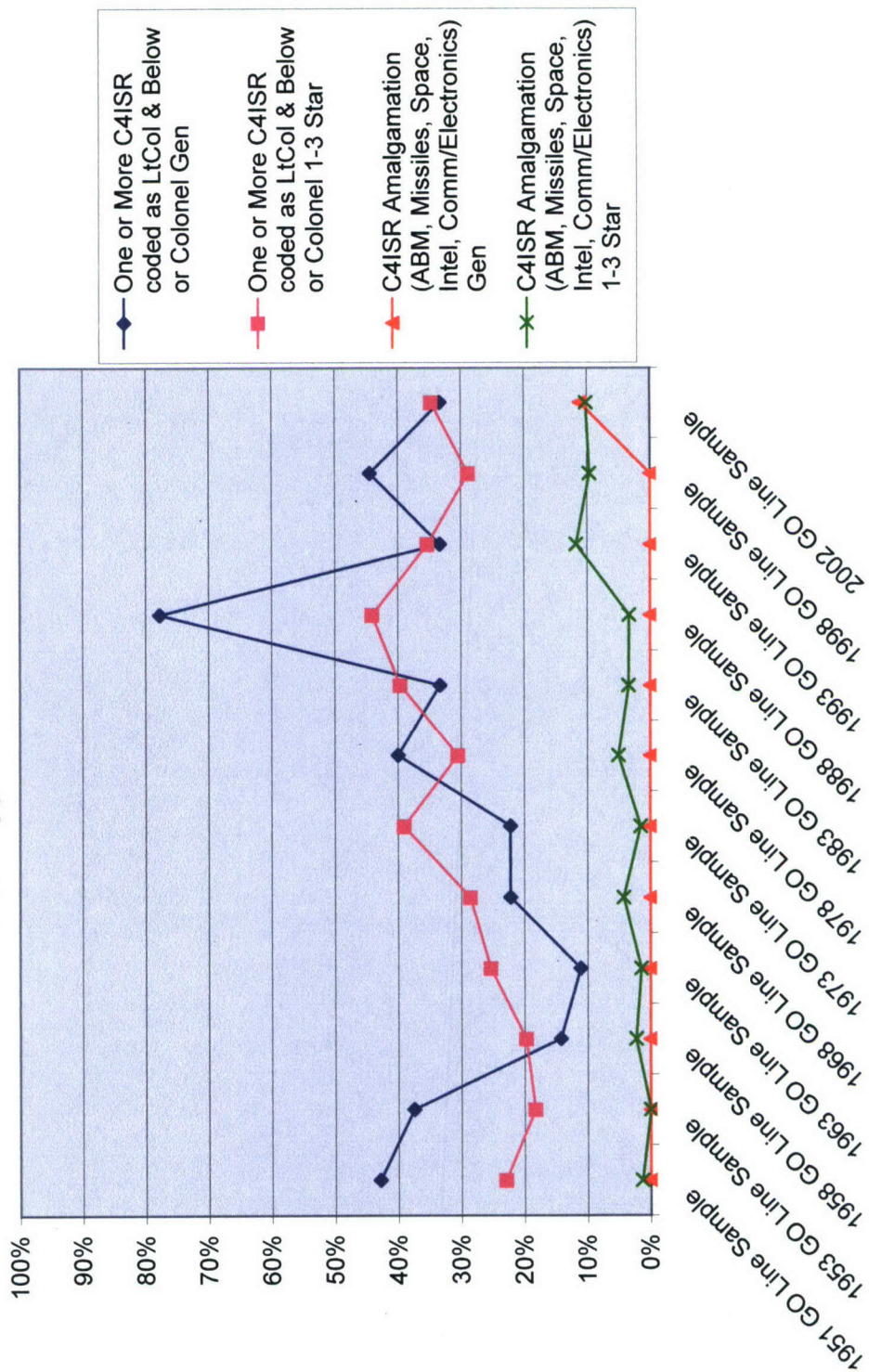




sample, started their Air Force commissioned service in C4ISR career fields and were promoted all the way through 4-star general officer rank.

Chart 10-15 (GO Samples: General versus 1-3 Star General Officers – One or More C4ISR-Coded Tours per Individual Officer as LtCol and Below, Colonel, or GO versus Apparent C4ISR AFSC GOs) adds the data from general officers whose first C4ISR tour occurred in the general officer ranks to the preceding chart. The 4-star general officer curve continues to be erratic and extremely sensitive to minor changes in data inputs because of the small sample sizes involved. The 1988 peak is no longer the standout feature since adding the general officer level data creates a second peak in the 1978 sample as well as a smaller peak in the 1953 sample. Furthermore, eight of the twelve samples now yield percentages over 50%. The range of percentages for the 1-3 star general officer data is now mainly between 30% and 50%, and nine of the twelve samples indicate that over one-third of 1-3 star general officers have served a minimum of one C4ISR tour in the rank categories of lieutenant colonel and below, colonel, or general officer. Furthermore, the percentage of 4-star general officers with at least one C4ISR-type tour is larger than the percentage of 1-3 star general officers in eight of the twelve samples. Consequently, one can make the claim that 4-star general officers have become more C4ISR experienced over time and that they could very well be looking for this experience when promoting 3-star generals to 4-star rank. The chart also provides the curves for the apparent Air Force Specialty Code C4ISR general officer amalgamation for 4-star and 1-3 star general officers. Although the overall trend in the

**Chart 10-15: GO Samples: General versus 1-3 Star General Officers -- One or More C4ISR-Coded Tours per Individual Officer as LtCol & Below or Colonel versus Apparent C4ISR AFSC GOs**





1-3 star curve is still positive, the overall values are lower than in the initial Air Force Specialty Code curve in the preceding chart since many officers left the C4ISR fields during their careers. The same is true for the 4-star apparent AFSC curve since the officer whose initial Air Force Specialty Code was reported as C4ISR in the 1988 sample apparently changed to a different career field. In both charts, it is clear that the largest part of the growth in general officer C4ISR experience is produced by officers who do not have initial or apparent Air Force Specialty Codes that fall within the C4ISR amalgamation.

#### The Increase in General Officer Non-Rated Badge Wear

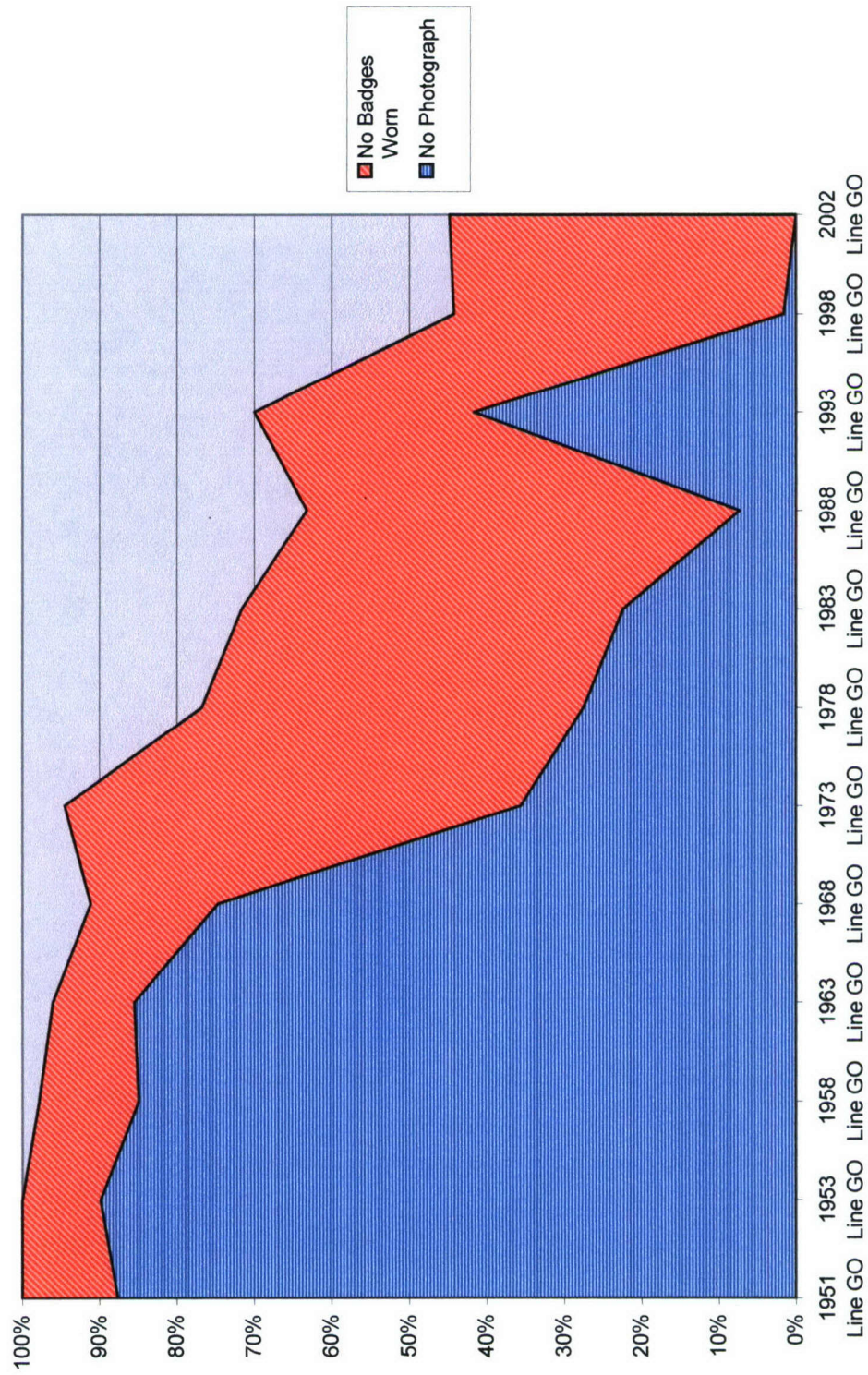
General officer wear of job specialty and other non-rated badges is a potential indicator of two things. First, since there are some prerequisites for any badge wear, wearing an occupational specialty badge indicates that the officer has met those prerequisites and perhaps served in that particular field in some capacity. As with wings, a star on top of the badge indicates a senior qualification and a longer period of service in that field, and a wreath around the star indicates the master qualification and an even longer period of service in the field. Second, since non-rated badges are optional and not required to be worn, wearing a badge indicates a willingness to be associated with that particular specialty. These two factors together indicate that wearing non-rated career specialty badges would tend to reflect a more visionary perspective, i.e., there are a lot of non-flying jobs and they are important within the Air Force officer corps. The heroic pilot warrior might be forced to serve a tour in a non-

flying specialty, but since the badges are optional wear, such an officer would never have to stoop so low as to promote that career field by wearing its badge proudly on his chest or pocket. Even if wearing the badge was meant to indicate that pilots reign supreme and can easily step down and perform a non-flying job with ease, no one would wear the non-rated badge if it was an embarrassment and no prestige was associated with it. At a minimum, it says that the heroic pilot warrior wearing the badge is so good that he can fly and master other career fields too, but this in itself is visionary thinking since it implies that Air Force officers should master other, non-flying areas, too.

However, there are several caveats that must be kept in mind when studying Air Force officer badge wear. First, with respect to the general officer samples, the primary method for identifying non-rated badge wear is the officer's picture. However, in the 1951 through 1968 samples, the majority of the general officer biographies do not contain photographs. See Chart 10-16 (GO Samples: Total Line General Officer Non-Rated Badge Wear by Percent, No Photograph, No Badges Worn). Even in the 1973 sample, 36% of the sampled biographies do not contain photographs. Although the trend from the 1973 sample through 2002 is a steady increase in the percentage of biographies with photos, reaching 100% in 2002, the 1993 sample is an anomaly, with 42% of the biographies not having photographs. Furthermore, the photographs may not capture missile operations and missile badges, which are worn on the pocket, and often below the photograph's crop line. Another caveat is that most of the career field



**Chart 10-16: GO Samples: Total Line General Officer Non-Rated Badge Wear by Percent, No Photograph, No Badges Worn**



specialty badges were not part of the original Air Force uniforms and were introduced over time from the 1950s onwards. Consequently, an officer in an earlier sample may have performed duty that later might have qualified him to wear a particular specialty badge. In addition, Air Force regulations limit the number of wings and badges that can be worn and prioritize the wear of aeronautical-type ratings and badges. A pilot must wear the pilot's wings, and if the officer has earned parachute "wings," they must also be worn, which precludes the wear of any other occupational specialty badges except the missile variants that are worn on the pocket. Consequently, there are many reasons that the samples may undercount badge wear.

A second problem area is that the qualification requirements for a particular badge may be misleading. An officer can qualify for the space or missile badges by working in acquisitions on space or missile systems. Consequently, the badge seems to imply experience in space operations, but it does not necessarily mean that. Since there is an acquisitions career field badge, this aspect is particularly interesting and peculiar because the qualifications seem specifically designed to allow rated officers to add space or missile ornamentation to their uniforms. An acquisitions officer who buys aircraft is not awarded pilot wings, and an acquisitions officer buying command and control equipment is not awarded the air battle manager badge or wings, or the air traffic control badge, but any officer working acquisitions on space or missile systems seems to qualify for the space or missile badges. This seems to be a spin-off of the Strategic Air Command bomber and missile unit amalgamations. Obviously only a



pilot could command, but if he at least had a *pocket rocket* (missile badge on his pocket) it would somehow ameliorate relations with his missilier subordinates. Of course, the pilot commander would not typically have earned the missile operations badge and sat alert in missile silos, and judging by the biographies, the missile badge often appears to have been awarded simply for commanding an amalgamated unit.

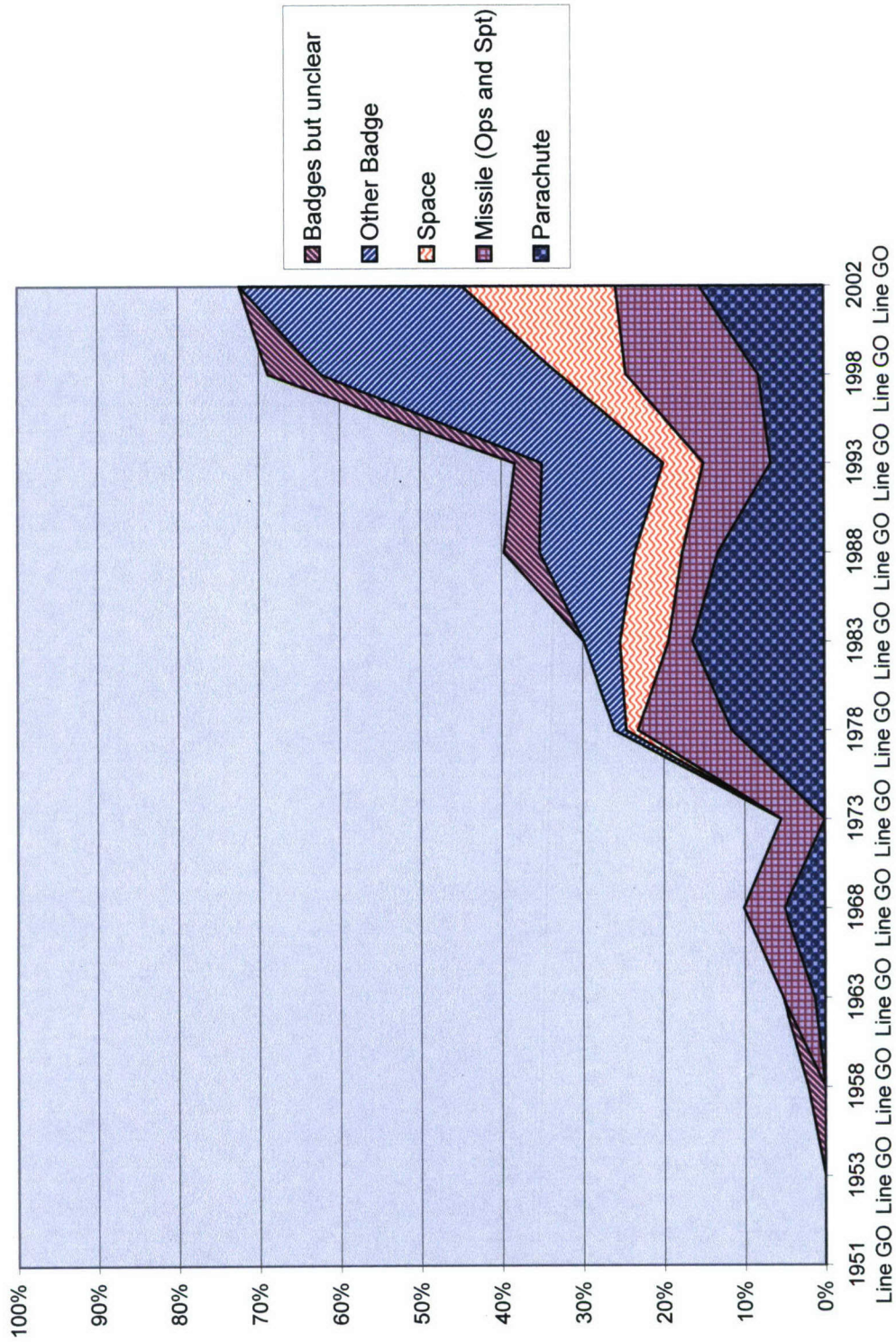
The third major problem area is that while badge wear indicates a willingness to be potentially identified with a particular qualification or career field, the actual motivating reasons for wearing or not wearing badges remain unclear. Some officers appear to treat the badges as something akin to merit badges – the more, the better. Officers with this perspective appear to be following the logic that the profession values senior officers with a breadth of experiences, and there is nothing like two badges on top of your ribbons and a pocket rocket of some sort to visually display your résumé. It is a visionary approach—there is more to the Air Force than just flying. Other officers appear to follow the Strategic Air Command example above, and try to wear a badge that at least presents the illusion that the commander, although rated for example, has experience of some sort in the unit's line of work. This is also visionary in approach because the heroic pilot warrior would find his pilot's wings sufficient justification to command a maintenance unit. There is also an implication that some officers wear the badges in some settings, but not in others, since some officers listed in their biographies that they were qualified for particular specialty badges, but did not wear them in their photograph, indicating nuances and an attempt to be both a visionary and heroic

warrior. Finally, there are many officers, particularly in non-rated career fields, that do not wear any career field specialty badges, although there is one available for their career specialty. It is not clear if these officers simply prefer a clean, uncluttered uniform, cannot decide which ones to wear from several choices, do not believe that career badges or wings are useful, or feel themselves to be simply Air Force officers first, and not pilots or accountants. Such sentiments might also be labeled visionary, which potentially confuses the issue of badge wear since it appears that wearing non-rated badges tends towards a visionary approach, especially in rated officers, but not wearing badges might be visionary, especially in non-rated officers. This study, however, starts from the premise that increased non-rated badge wear among general officers lends credence towards a more visionary general officer corps.

These caveats notwithstanding, there is some useful information to be gained from a short study of general officer badge wear. The first fact is that badge wear has increased dramatically across the samples. See the previous chart (Chart 10-16), which shows that the combined percentages of general officer biographies without photographs and those with photographs not showing any badges worn decreases relatively steadily, excluding bumps in the 1973 and 1993 samples. By the 1998 and 2002 samples, approximately 55% of the line general officers samples were wearing one or more non-rated badges. Chart 10-17 (GO Samples: Total Line General Officer Non-Rated Badge Wear by Percent) excludes those biographies that do not contain photographs as well as those not showing any badges worn in the photographs, and



**Chart 10-17: GO Samples: Total Line General Officer Non-Rated Badge Wear by Percent**



allows multiple badge entries per individual officer biography. This inflates the overall percentage, but provides more detail into the badges worn. The inflation generally increases with successive samples, indicating that not only the wearing of badges, but also the wearing of multiple badges increased over time. If parachute wings, which have also been called an Air Force Academy fraternity pin because of the high number of cadets who earn the jump wings while at the Academy, are eliminated, the result is Chart 10-18 (GO Samples: Total Line General Officer Non-Rated Badge Wear by Percent, Excluding Parachute Wings).

The wear of the missile badge, which includes both the operations and support variants, and the space badge are of particular interest because of their C4SIR connection. The first missile badge was seen in the 1963 sample, after which at least one general officer per sample wears a missile badge. The first space badge was worn in the 1978 sample, and like missiles, was worn by at least one officer in each successive sample. In fact, by 2002, the number of space and missile badges per officers in the sample almost reaches 30%. The growth in popularity of wearing a missile or space badge is interesting because these badges are being worn mostly by rated officers. Chart 10-19 (GO Samples: Total Line General Officer Missile (Operations or Support) Badge and/or Space Badge Wear by Percent) provides a comparison of the percentages of missile badges and space badges worn divided by the line office sample, and the percentage of line general officers per sample with apparent space or missiles Air Force Specialty Codes. In the 1963 through 1973 samples, there



**Chart 10-18: GO Samples: Total Line General Officer Non-Rated Badge Wear by Percent, Excluding Parachute Wings**

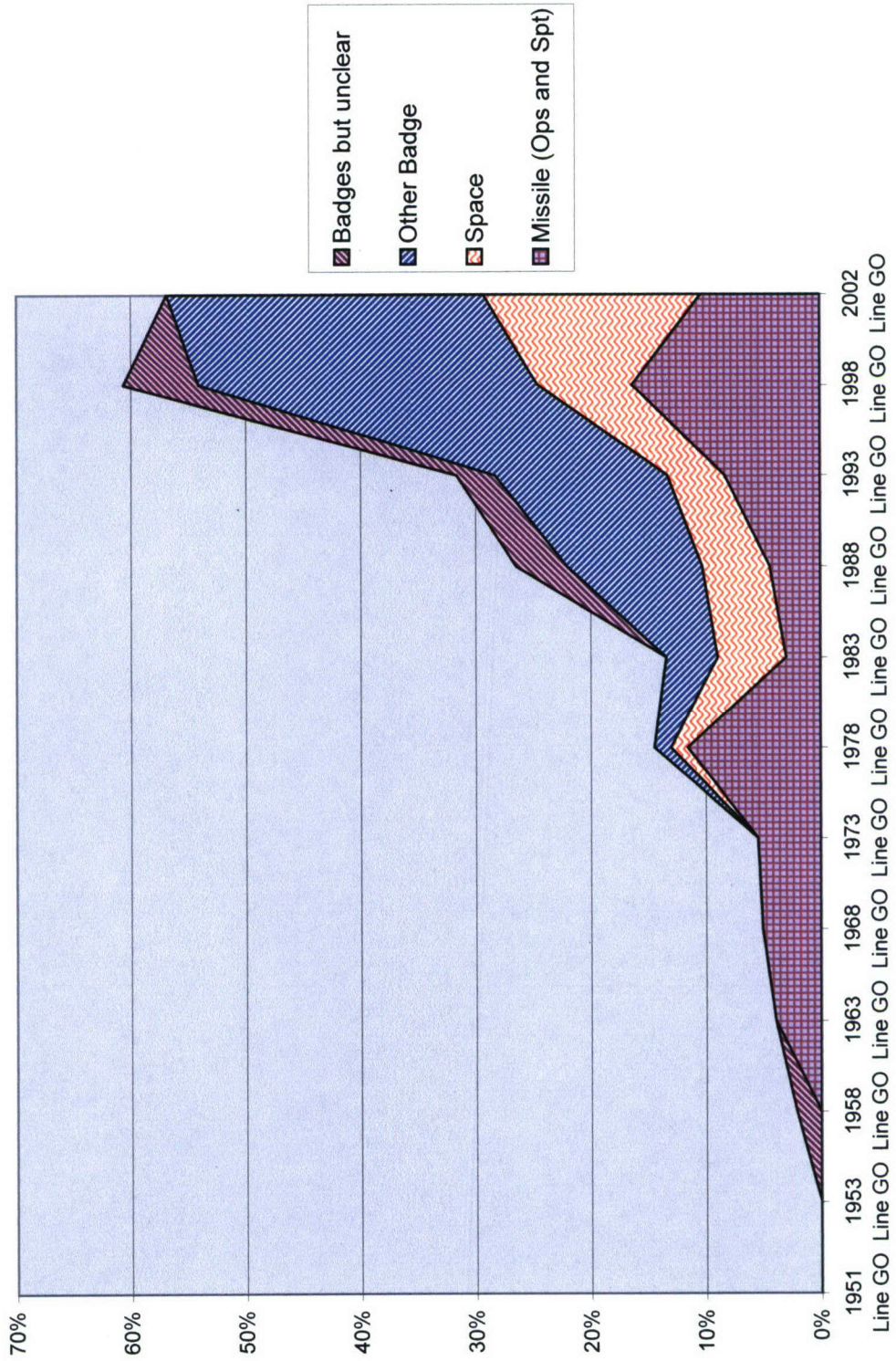
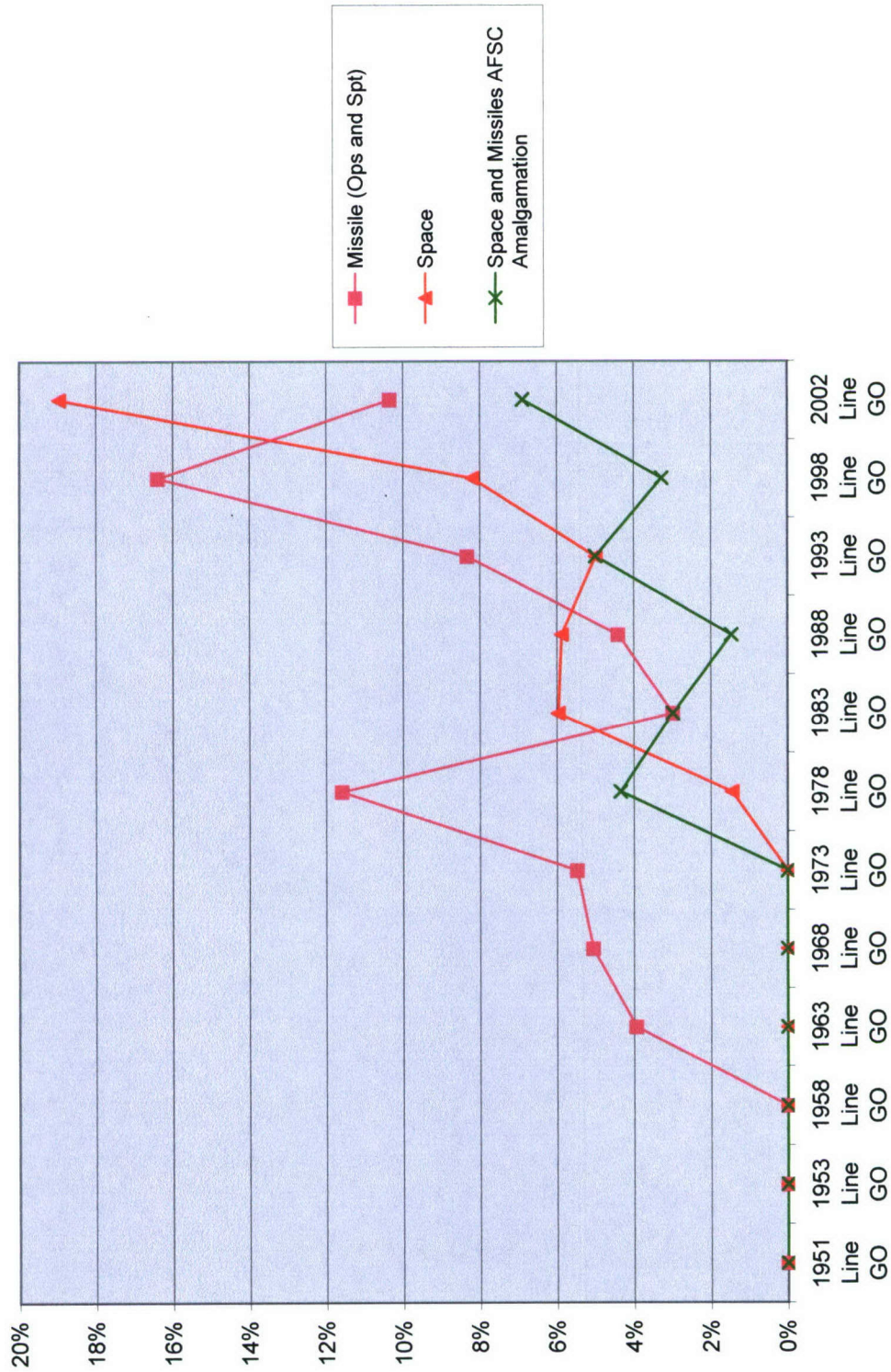


Chart 10-19: GO Samples: Total Line General Officer Missile (Operations or Support) Badge and/or Space Badge Wear by Percent

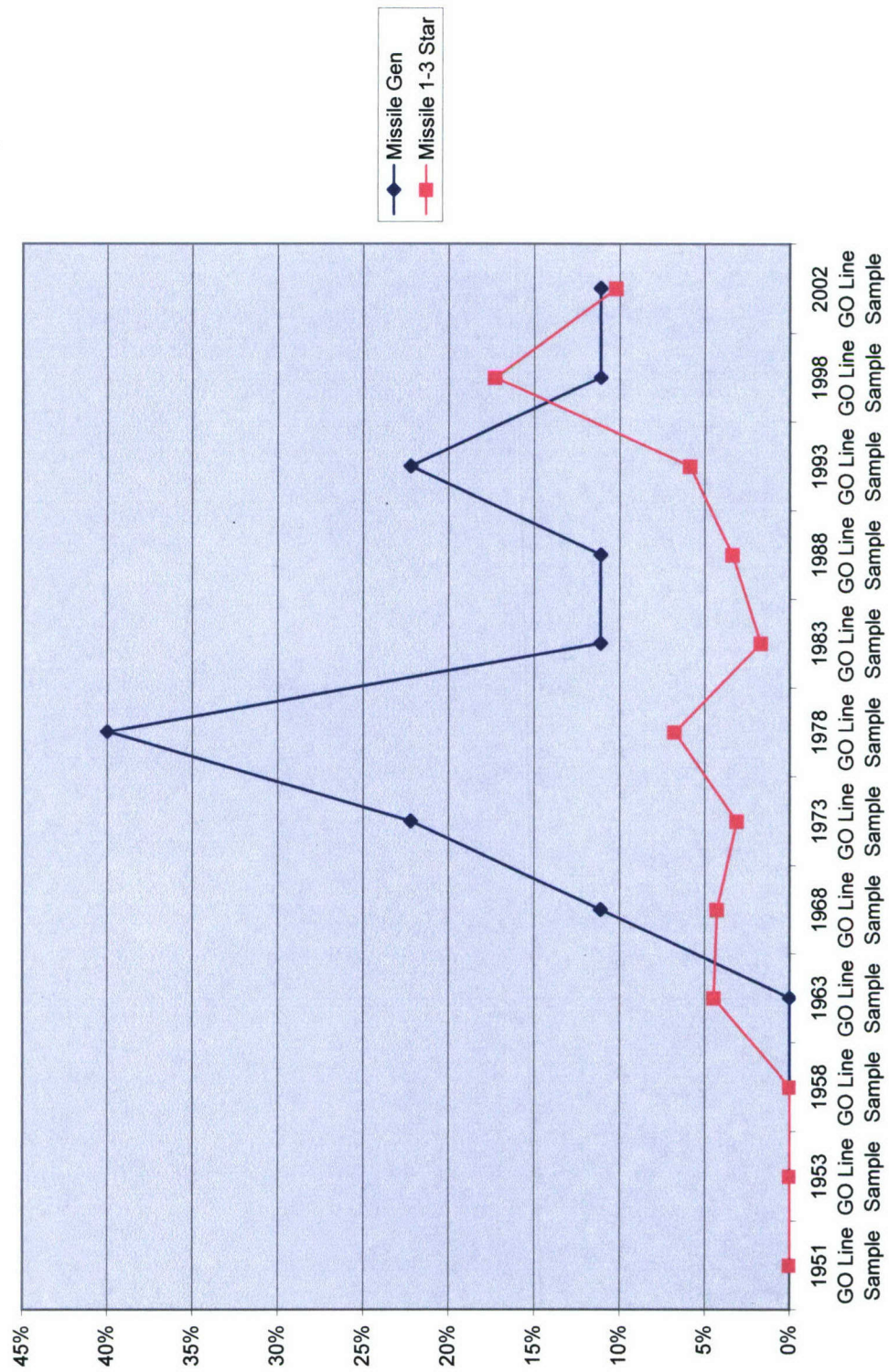




are not any general officers with apparent space or missile specialties, but some general officers sport missile badges, and in the 2002 sample, when there are close to 30% space and missile badges distributed over the sample, only 7% of the general officers in the sample appear to be in space or missile career specialties. Consequently, there appears to be a sizable and growing segment of the general officer corps that is willing to, or desiring to, appear to be associated with the space and missiles career fields. However, it is not clear if this indicates a general desire for general officers to be or to have been connected to these C4ISR aspects of the Air Force officer corps' jurisdiction, a result of a purposeful funneling of up-and-coming officers through space and missile billets either for broadening experience or to bind a potentially rebellious arm of the service, or cross-training in acquisitions that is masked by the space or missile badges.

In any case, the 4-star general officers sample are not lagging in missile or space badge wear. Chart 10-20 (GO Samples: General versus 1-3 Star General Officers – Badges – Missiles (Operations and Support)) shows that at least one 4-star general from the 1968 through 2002 samples wore a missile badge, with more than one 4-star general with a missile badge in the 1973, 1978, and 1993 samples. This is particularly noteworthy since from the 1963 through 1993 samples, only one to three 1-3 star general officers were wearing missile badges. However, it also reflects the Strategic Air Command tradition of commanders wearing a missile badge. The case for wear of the space badge is not quite as compelling, although the 2002 sample data indicates the potential beginning of trend of increased space badge wear among 4-star general

Chart 10-20: GO Samples: General versus 1-3 Star General Officers -- Badges -- Missiles  
(Operations and Support)



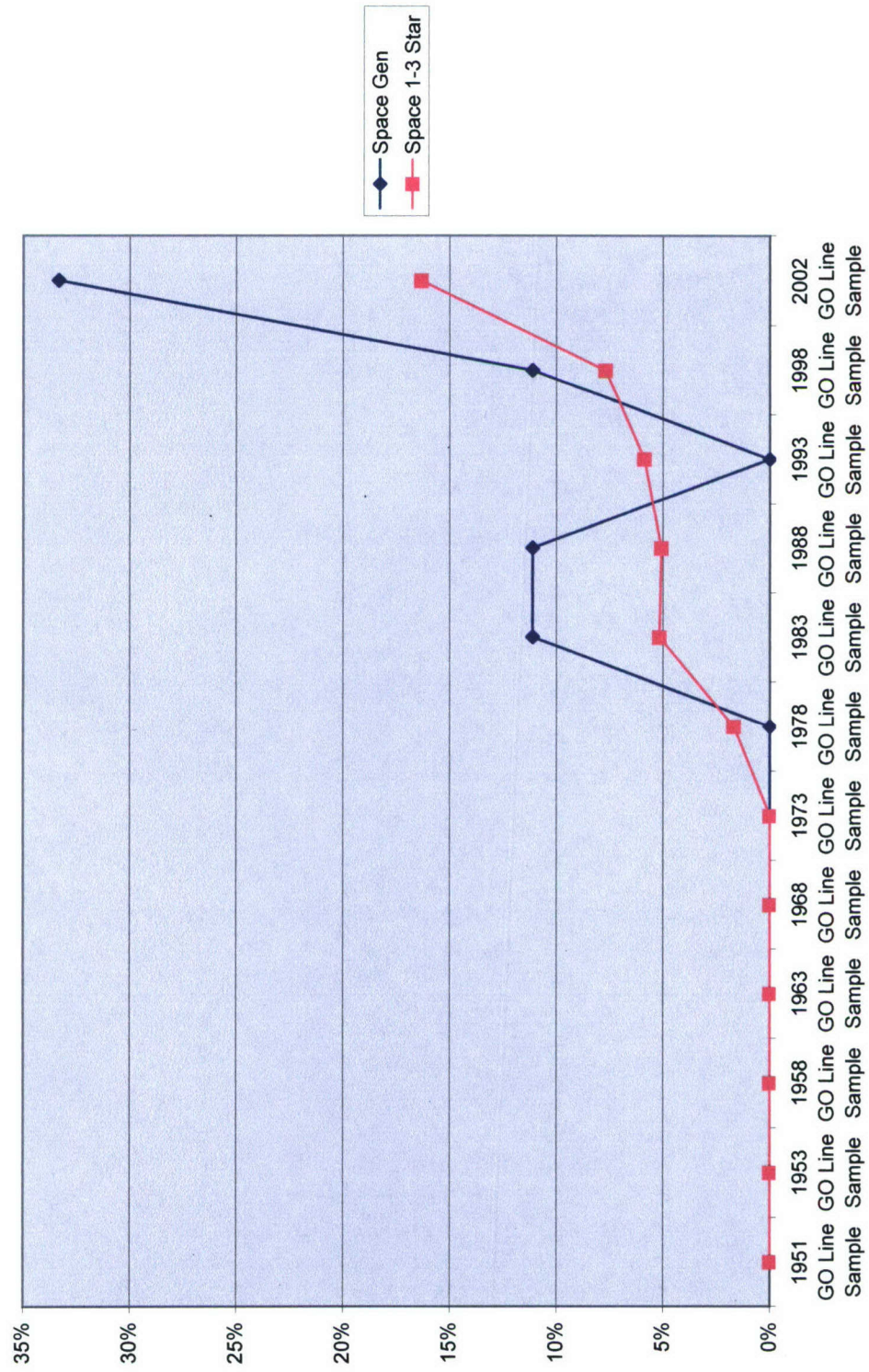


officers. See Chart 10-21 (GO Samples: General versus 1-3 Star General Officers – Badges – Space).

### Conclusion

This chapter provided an in-depth examination of the increasing importance of C4ISR to the general officer corps as seen in a variety of C4ISR indicators in the general officer sample data. The chapter began by documenting the clear trend of increasing percentages of general officers with C4ISR career field codes. This trend is apparent whether one looks at the general officers initial Air Force Specialty Codes (12% of the line general officers in the 2002 sample), or their apparent specialty codes (10% of the line general officers in the 2002 sample). The percentages for initial C4ISR career field codes was actually two points higher than the percentages for apparent C4ISR specialty codes because of a net loss in the C4ISR career field due to officers changing their career fields. Although the C4ISR amalgamation shows slight net losses, this means that officers in other apparent AFSCs actually have experience in junior rank C4ISR positions. Furthermore, as the number of Air Force C4ISR officer billets climbed from 15% to 24% of the line officer billets between 1961 and 2002, the percentage of line general officers with apparent C4ISR AFSCs climbed from 1% to 10% across the 1963 through 2002 samples. The growth at both levels appears to be systematic. However, the 15% under-representation in the general officer curve also appears systematic. This is a tribute to the strength of the structural factors discussed in

Chart 10-21: GO Samples: General versus 1-3 Star General Officers -- Badges  
 -- Space





Chapters 7 and 8 that limit the advancement of non-pilot officers to general officer ranks.

Although the percentage of C4ISR general officers is clearly increasing, the second section of the chapter examined the possibility that other officers are also filling C4ISR billets since Chapter 8 made clear that large numbers of rated officers have historically filled non-rated career field billets. The section looked at the percentages of line general officers who reported serving in C4ISR jobs in the three rank categories of: lieutenant colonel and below; colonel; and general officer. The trend over the course of all the samples was that initially more general officers reported C4ISR tours in the rank of colonel, but that over time, duty in the lieutenant colonel and below ranks exceeded C4ISR duty in the colonel level. This indicates a shift from the pilot colonel overseer of C4ISR technical specialists to an actual participation of rated officers in C4ISR at more junior ranks. If each officer is only counted a maximum of once across all three C4ISR rank categories, roughly one-third to one-half of the general officers per sample have historically had at least one C4ISR tour in at least one rank category. In the 2002 sample, 52% of the line general officers reported at least one C4ISR tour, which indicates broad C4ISR experience across the general officer ranks, far in excess of the 10% of the general officers with apparent C4ISR career specialty codes. The analysis of the trend of the increasing wear of non-rated badges by line general officers yielded a similar result. By the 2002 general officer sample, for example, the number of space and missile badges worn by general officers was approximately four times the general

officers with apparent space or missile career specialties. This provides another indication of the ample evidence that the general officer corps has not only become increasingly aware of the importance of C4ISR, but has increasingly become more experienced in C4ISR and visionary forms of warfare.

With respect to the two competing scenarios presented at the beginning of this chapter, it is clear that C4ISR is no longer a specialist task, relegated to the periphery of the officer corps. The scenario for the officer specialist was described as: *One would expect C4ISR officers to work in narrow career tracks, with minimal career-broadening or professional development opportunities. Promotion rates would not be particularly high, few would make it through the system far enough to be promoted to colonel, and very few would ever become generals. The lower ranks of the C4ISR career fields would be manned exclusively by specialists, with more pilots present in the C4ISR field grade ranks, and predominantly pilots serving in C4ISR billets at the colonel and general officer levels. Air Force general officers would primarily be pilots with almost no C4ISR experience until the rank of colonel. In fact, they could expect most C4ISR duty to actually occur in the general officer ranks.*

The data in this chapter shows that this is clearly not the case. At the line officer level, the increasing trend in the percentage of line officers in C4ISR specialties reached 24% by 2002. In other words, there were more C4ISR officers than pilots in the officer corps. However, they are no longer technical specialists being supervised by pilot colonels and generals. First of all, across the sample period, the trend is for more



general officers to serve in C4ISR duty at lieutenant colonel and lower ranks. This indicates a more integrated approach to C4ISR. C4ISR experience at lower ranks builds a deeper understanding and presumably a career long affinity for its affects. In addition, over 50% of the line general officers reported at least one C4ISR tour in the 2002 sample, which reinforces the idea that C4ISR is a field in which the general officer corps has experience as well as understanding. Furthermore, the rise of C4ISR generals to comprise 10% of the line general officer corps is further proof of the officer corps' integration of C4ISR into its core. However, the data is not quite at the level painted in the other scenario since that scenario also called for *Air Force general officer ranks would be loosely representative of the career field composition of the field grade and company grade ranks*. The historic 15% under-representation of C4ISR line general officers with respect to the C4ISR representation in the line officer corps indicates that the structural factors described in Chapters 7 and 8 are enduring.

## **Chapter 11: Conclusions, Implications, Applicability Beyond the Air Force Officer Corps**

This chapter is divided into four sections. The first presents a summary of the manuscript's argument, which is followed by a discussion of the implications of that argument for the Air Force officer corps. The third section briefly examines the applicability of the model and methodology of the manuscript to further study of professions and profession-like organizations. The conclusion follows.

### **Summary of the Argument**

In its simplest formulation, this manuscript uses the concept of profession to explain why 60% of Air Force general officers are still pilots when pilots comprise just 20% of the officer corps. The basic background is that the percentage of Air Force general officers who are pilots declined from approximately 90% in FY1948, the year of the Air Force's independence, to approximately 60% in FY2003. Over the same period, the percentage of total Air Force officers who are pilots decreased from 50% in FY1948 to approximately 20% in FY2003. The decreases are roughly parallel, and the gap remains. Since pilot general officers presided over the process, and the data indicates a leveling out, and possibly renewed growth in the percentage of pilot general officers by FY2003, there is more involved than the simple issue of why the percentage of pilot generals started out so high or the percentage of pilots so low. Pilot general officers have consciously lowered the percentage of pilots in the general officer and total officer ranks, but there appears to be a limit.



The puzzle is interesting because the issues of whether this is a “good” or predictive occurrence depends on the viewer’s perspective or model. To the public at large, the Air Force appears to be all about flying. Therefore, most generals should be pilots. From this perspective the question is why are the percentages of pilots and pilot general officers decreasing, and perhaps, what is being done to reverse these dangerous trends? From a bureaucratic politics perspective, the question is why are the percentages of pilots and pilot general officers decreasing since pilots were obviously the major group and possessed a near monopoly on political power within the organization? An organizational culture perspective yields the question of why are the percentages of pilots and pilot general officers decreasing since the organizational culture was so dominated by the pilot in mythos and in practice? However, from a business perspective, the question is different. If the percentage of total Air Force officers who are pilots has already dropped so precipitously because they are no longer needed in such numbers and because the Air Force is moving aggressively into new non-pilot markets, why are there still so many pilot general officers?

Of the perspectives and models listed above, the general public’s perspective provides an important reason for using the concept of profession: The general public perceives itself to have a stake in the officer corps’ composition and missions. Furthermore, the distinguishing characteristic of the Air Force officer corps is that it identifies itself as a profession. That profession develops new fields of expertise in order to maintain its relevancy in the face of the changing character of warfare, and the

officer corps' composition changes as its expertise changes. The primary motivations for these changes are the responsibilities inherent in the profession's contract with society. However, major adjustments in professional expertise require society's acceptance in the form of an award of jurisdiction over a specific competency to one or more professions. Consequently, the combination of responsibility and jurisdictional competition resulted in pilot general officers selecting courses that over time have led to an Air Force in which the locus of decision-making is evolving out of the cockpit and into the C4ISR system. Pilots and flying, once the hallmarks of the Air Force, have become much less important. However, pilots remain overrepresented in the general officer ranks because of past structural factors stemming largely from the officer corps' strategies in its struggle to establish itself as an independent profession. In fact, these structural factors have masked the dramatic changes in the Air Force officer corps' expertise, composition, and jurisdiction. Meanwhile, the Air Force officer corps reassures society that the profession is continuing to meet its obligation to defend the nation in an effective and efficient manner while simultaneously seeking a grant of monopolistic jurisdiction over C4ISR and visionary forms of warfare. C4ISR, because it is the backbone of all Air Force operations today—nothing can be done without it—and visionary forms of warfare because they may replace manned flying operations tomorrow.

The manuscript can be divided into four parts for clarity of argument. However, before beginning with the parts, it is important to note that in this manuscript, the Air



Force officer corps is treated as an independent profession in competition with the other service officer corps as well as with other organizations; instead of the more common treatment of officers from all services forming part of a single profession. The first part of the manuscript developed a descriptive model of profession for the Air Force officer corps, which provided the foundation for the rest of the manuscript. The second part examined the profession's expertise and the related concept of jurisdiction, developing the argument that C4ISR, together with visionary forms of warfare, has become a critical expertise and Air Force officer corps jurisdiction. The third part dealt with the profession's corporateness, and in particular, the structural factors within the officer corps' history that created or perpetuated the overrepresentation of pilots in the general officer ranks. The final part presented an array of sample data from general officer biographies that indicated both the evolution of the general officer corps and the increasing importance of C4ISR.

The descriptive model of profession was developed from ideas culled from the writings of Samuel Huntington, Morris Janowitz and Andrew Abbott. The descriptive model of profession is shown in the figure below (Figure 11-1). The basis of the model was a transformation of Huntington's static three pillars of a profession into a more dynamic setting, in which expertise, corporateness and responsibility interact within the profession. The basic circular shape represents the profession. The three pie pieces represent expertise, corporateness and responsibility, and the light blue arrows symbolize the interaction between these concepts. The outer ring was based on an

adaptation of Janowitz' heroic leader and military manager archetypes, and depicts the two new archetypes of heroic warrior (teal blue) and visionary warrior (purple), broken out into each of the pie pieces. The red arrows in the outer ring indicate the tension between the heroic warrior and visionary warrior archetypes in the areas of expertise and corporateness. Expertise tends to be somewhat dominated by the visionary warrior archetype, and the concept of corporateness is more heavily dominated by the heroic archetype. Responsibility is depicted as being equal between the archetypes since both feel the obligation in similar terms. The final piece of the model comes from Abbott's concept of focusing on the task or work that professions do to unveil jurisdictional struggles between professions. The dark blue arrow indicates the struggle between the Air Force officer corps and outside groups for jurisdiction in areas that the officer corps believes it has or wants jurisdiction.



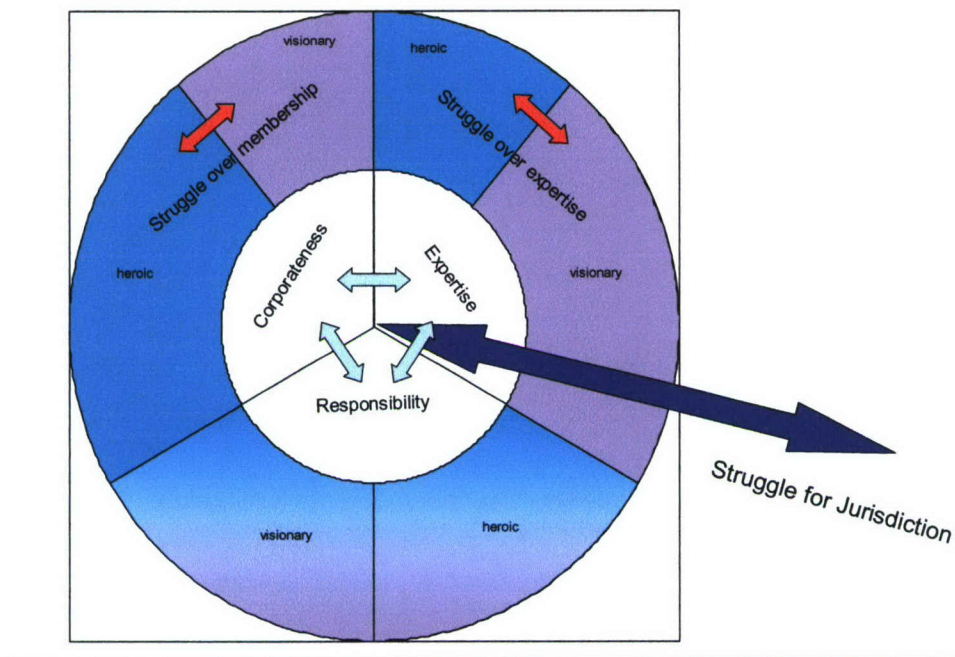


Figure 11-1 Descriptive Model of Profession

One can then take this two-dimensional drawing and visualize it as a sphere floating in space with other spheres, each representing a profession or profession-like grouping of people. The spheres may remain intact as they compete and each may be awarded a share of a jurisdiction. However, other outcomes are also possible. Like soap bubbles, as the professions compete, the personnel and missions at the peripheries may become entwined, and the dominant may totally absorb the other profession and monopolize the new jurisdiction. Conversely, as was the case with the Air Force officer corps, a bubble might develop within an existing profession and then pop off, forming its own bubble and dominating a new jurisdiction. It is also theoretically possible for a new profession's bubble to seemingly pop out of nowhere (from a non-profession, for

example) with personnel and expertise to fill a new jurisdiction. This descriptive model provided a synthesis of several ideas on profession and served as a definition of profession for this manuscript.

The second part of the manuscript, which examined expertise and the related concept of jurisdiction, began with a review of three military theoreticians' writings on the officer corps' expertise. This was done partly as a bridge between the theory of the model and discussions on the Air Force officer corps' expertise. It was also important to confront the issue up front on whether airplanes and piloting are the Air Force officer corps' expertise because the Air Force's short history is so entwined with planes and pilots. However, Douhet, von Clausewitz, and Huntington all argue that the expertise of the profession of officership is more abstract than mastering the use of a particular piece of military equipment. Douhet, the airpower advocate, is not looking for pilots, but men who can lead a revolution in military affairs. His view of expertise is something that can be provided by men who are familiar with the art of war and are open to new ideas. Men who can create a revolutionary combat force and direct that force in battle. Von Clausewitz proffers *military genius*, and Huntington, management of an organization conducting violence. They are somewhat akin to the story of the blind men, each touching a different part of an elephant, trying to describe the whole. That whole is not flying, piloting or aircraft *per se*. It is the ability to create the force and lead that force through the fog and the friction of war while remaining open to new ideas. The term *airpower* perhaps best captures the initial Air Force officer corps'



expertise. The Air Force officer corps is still very much about flying, but that is no longer its primary focus. Over time, it has developed an expertise in C4ISR, as a concept, in order to support commanders' *military genius* and to manage the organization's application of violence, while simultaneously opening the door to further visionary forms of warfare such as information warfare and effects-based operations. This C4ISR concept, coupled with visionary forms of warfare, greatly exceeds the connotations of *airpower* and has become a new Air Force officer corps expertise.

The discussion on expertise then shifted from the theoretical to the practical, presenting various data and graphs that revealed first that the history of the Air Force and its officer corps were marked by change. The weight of effort given to particular missions varied over time, and new types of work have been developed and incorporated into the profession. For example, take strategic attack, which was a key part of the founding mythos of the independent Air Force. In terms of jurisdictional claims, however, the Air Force officer corps went from a monopoly on strategic attack in 1947 to a shared jurisdiction involving Air Force ICBMs and bombers, as well as Navy SLBMs in the 1960s. Within the Air Force, it was clear that strategic attack declined relative to other missions, especially to the tactical or general purpose forces. Furthermore, it was possible to document the clear growing importance of C4ISR to the officer corps in terms of the growth of C4ISR squadrons, manpower in C4ISR billets, and budgetary obligational authority. This indicated that C4ISR was a jurisdiction that the Air Force officer corps was filling.

After making the case for C4ISR with data, the manuscript turned to the impact of technology on the profession. The first section on technology looked at aircraft and weapons. Technology obviously has been making aircraft better and better, and the most modern combat aircraft can generally fly higher, faster, further, and more safely than their predecessors. Operationally, they can bomb more accurately, even with dumb bombs. In the air-to-air arena, fighters can shoot targets well beyond visual range. Furthermore, improvements in on-board technology and the command and control system, as well as rules of engagement that place great reliance on both, now tend to make this capability a reality in combat operations. This advantage improves aircrew effectiveness and survivability. In the air-to-ground arena, precision guided munitions (PGMs) with better stand-off ranges and the launch and leave capabilities dramatically increase aircrew survivability. However, each step away from the basic gun is a step towards more intrusive command and control system involvement. Each step is also a step towards potential unmanned air combat vehicles (UCAVs) as more of the flying and combat phases are computed and controlled by computers and electronic presentations that can be data-linked off-board. The trend is clearly toward PGMs, and it is not just toward generic PGMs, but those in the launch and leave category, which places the lowest demands on piloting skills. The heroic warrior cannot use his gun in most air-to-air situations. An enemy fighter would kill him with a beyond-visual-range missile while he was still just a dot on the radar scope. Enemy SAMs will do the same thing unless they are jammed or diverted by automatic on-board systems or other



specialized aircraft. Heroic warriors understand this and realize that they cannot survive without relying on modern technology and modern weapons, which indirectly creates a greater reliance on the C4ISR system.

From the visionary warrior's perspective, the Air Force's use of camera clips of PGMs hitting targets so perfectly in Desert Storm, in the Balkans, and in Afghanistan and Iraq has contributed to the public's awarding of a jurisdiction of sorts on precision in warfare to the Air Force. Concurrently, however, this has raised public expectations that survivability and accuracy will continue to increase and that collateral damage will continue to decrease. Although this requires the officer corps to continue to improve its weapons, it places a bigger burden on the C4ISR system to find, identify and orchestrate attacks on specific targets. It also carries an inherent endorsement of the effects-based operations concept. Carpet bombing causes immense and random destruction and wreaks havoc, chaos, panic and terror. Precision attacks on a relatively few small number of targets can only be effective if the attacks result in a specific and predictable effect. This in turn, places a new requirement on the C4ISR system. However, it must be able to overcome cultural and technological divides in order to reasonably predict the likely resulting effects from different attack scenarios.

As the precision of weapons increases, the number of aircraft, bombs or missiles required to suppress, damage or destroy a particular target has decreased. Increases in the range of weapons (or standoff range in the case of aircraft-delivered ordnance) mean that the depth of the potential battle area has increased. However, these two factors also

combine to mean that requirements for pilot “hot stick” flying decrease while pilot survival rates increase since fewer pilots (because fewer aircraft are required) are exposed to fewer threats (because of increased stand-off ranges). Furthermore, since surface-to-surface missiles are also increasing in range and precision, there is a growing jurisdictional dispute as, for example, Navy Tomahawk Land Attack Missiles (TLAMs) and aircraft, as well as Army Tactical Missile System (ATACMS) and artillery provide overlapping capabilities in terms of attacking some targets. For example, in the opening hours of Desert Storm, TLAMs, conventional air-launched cruise missiles, stealth fighters, fighters, and helicopters were all used to attack targets that once would have been the sole purview of fixed-wing, piloted aircraft.

If there is no requirement for pilots or weapons system operators to visually acquire and identify targets through the canopy, the aircraft only serve to bring the weapons close enough to be within firing range. Then the issue becomes one of whether it is more efficient to have flying warehouses of air-to-surface missiles or to fire them individually from the surface. At the extreme end of the weapons progression, the ICBM and its shorter-range cousins could replace the manned bomber and fighter-bomber, and SAMs the manned fighter-interceptor. In the middle lie solutions like Unmanned Combat Aerial Vehicles (UCAVs), which provide long loiter times over targets, and which could serve as fighters, actually engaging targets, or flying warehouses—all with “pilots” safely on the ground “flying” the UCAVs via joysticks or computer keyboards. At the near end of the weapons progression timeline, heroic and



visionary warriors continue to fly aircraft, use as many launch and leave weapons as possible, and watch as combat decision-making continues to migrate out of the cockpit and into the C4ISR system.

Command and control has always been an important, though understated component of airpower. The practical application of airpower does not rest on individual combat, but on independent air operations. Independent operations means that aircraft and missiles should be centrally organized, equipped, planned, and commanded to achieve specific objectives, which may or may not directly support ground and surface forces. This maximizes the effectiveness and efficiency of aircraft and missiles to attack targets that are beyond the pale of the imagination of a traditional ground or surface commander, at least partly because the range of action is so much broader and the speed of reaction so much faster than anything possible on land or on sea. Without aircraft, missiles or radio-electronic means, a ground or naval commander cannot think of shutting down the enemy's electric power grid in its capital or isolating the enemy leadership from its forces and population. Consequently, the basis of independent air operations has become the most centralized and controlled system as possible over all air and missile assets.

The amount of command and control exercised by the system outside the individual cockpits has evolved over time and is closely tied to technological advances. In the beginning, planning and procedures were the avenues of control, but radios, radar, computers, and data-links have all been the basis of significant advances in off-

board command and control over pilots and aircraft conducting combat operations. Strategic air defense initially took the lead in terms of the sophistication and the intrusion into flying operations since strategic air defense missions could be expected to take place entirely within friendly radar and radio coverage. However, tactical radars were quickly put to use providing air defense for tactical forces and they were used to provide coverage and some control over aircraft flying offensive air missions in Korea and Vietnam. The EC-121 with its airborne surveillance radar was used in Vietnam in an attempt to increase radar coverage over the entire area, and AWACS has been a constant in all air operations since its inception in the late 1970s. In addition, special ground radars were used to control B-52 bombing over South Vietnam. Finally, FACs played a critical role in directing fighters flying close air support missions from Korea through today, supplemented by the ABCCC and the JSTARS.

In addition to the radars, and command and control aircraft, the entire CAOC system, as the C4ISR focal point, has become the basis of Air Force operations. Planning itself has become very complex, rivaling the SIOP system with interlocking missions. Air Force officers have long grown accustomed to the CAOC, Air Tasking Orders, and the command and control system. The resources in terms of personnel and equipment required to coordinate, to plan and to control the execution of the Coalition's 2400-3100 sorties per day during Desert Storm was immense. And there has been no let down in the centralization of the CAOC-based command and control system, with the CAOC in Qatar, for example, running all air operations in both Afghanistan and



Iraq, with an infusion of new systems such as the Predator UAV feeds, and more control over space-based assets. Technology both justifies and allows the growing intrusion of the C4ISR system into the cockpit, with the simultaneous decrease in the potential realm of pilot decision-making. This in turn elliptically calls for a reevaluation of whether piloting provides the skill set that should dominate the officer corps' sense of expertise and leadership.

The CAOC is an Air Force product, largely manned by Air Force personnel, but with some degree of command and control over all airborne assets in a theater of operations. A CAOC C4ISR system orchestrated the opening attacks of Desert Storm, which included B-52s flying from the US, Navy Tomahawk Land Attack Missiles (TLAMs), Army helicopters as well as a variety of Air Force, Navy, Marine and allied aircraft stationed throughout the Gulf region. This expertise is the bedrock of modern airpower and it clearly embodies the concept of managing an organization achieving objectives through the application of, or the threat of, violence. However, C4ISR, together with visionary forms of warfare, forms an expertise in its own right. This expertise breaks out of the traditional American medium-based jurisdictional approach to warfare and is superordinate to airpower. The Air Force must not only maintain and expand this expertise; it must seek to expand its near-monopoly jurisdiction against competition from other services as well as from potential enemies. Despite lingering jurisdictional disputes with the other services on seam issues such as the exact amount of subordination to, or coordination with, the CAOC over Army helicopter operations or

Marine close air support missions, the Air Force appears to have a near monopoly on the jurisdiction of the joint air and space C4ISR system. In many ways, this jurisdictional claim is much more unique than Air Force jurisdictional claims over aircraft, missiles and satellites. In addition, the basic jurisdiction over the joint air and space C4ISR system provides the basis of the Air Force's expansion beyond electronic warfare into information warfare in order to counter potential enemy integrated air defense systems and to continue to have the capability to strike deeper and faster against less orthodox targets in the enemy's hinterlands than other services. The C4ISR system is the bedrock of visionary forms of warfare.

After making the case that Air Force officer corps' jurisdiction is changing and that C4ISR is now a critical expertise underlying all operations, the manuscript turned to the natural question of why then do so many Air Force members and the public at large think that the Air Force is still all about flying? Part three began with an analysis of structural factors within the Air Force and its officer corps that created or perpetuated the overrepresentation of pilots at the general office level. Three issues stood out: 1) An early requirement for 90% of the officer corps to be pilots; 2) The restriction of command of flying units to pilots; and 3) The Aviation Cadet Program's long-term impact on manning. In the interwar years the Air Service/Corps officer corps was required by law to be 90% rated. In its quest towards independence, the officer corps initially strove to become and to maintain an organization whose membership was almost completely pilot-based. In addition, the Army's division of officers into



different branches supported this general policy. However, over the long run, the officer corps found this policy unworkable and resolved itself to an inner core of pilots, surrounded in the next ring by observers and navigators, with all other supporting officers on the periphery. However, the tradition of a 90% pilot officer corps still colors public perception of the Air Force officer corps.

The second issue was that from 1926 through 1974, only pilots could command flying units, the Air Force itself, and all important entities in between. This was also originally done at the officer corps' behest in order to prevent more senior, but non-flying Army officers from coming in and taking the top leadership positions in the Air Service/Corps. The effect of the law was that as flying units were amalgamated with non-flying units at ever higher levels of command, non-pilots were systematically excluded. This in turn led to an overrepresentation of pilot officers at senior ranks, giving the appearance that the Air Force officer corps was indeed all about flying. However, the officer corps pressed Congress to remove statutory restrictions on command of flying units in 1974. This technically opened the door for any Air Force officer, regardless of rating or career specialty, to command a flying unit, but only navigators were initially permitted this privilege. Whereas the battle over the importance of navigators was largely fought with statutes, the officer corps prohibited, under the guise of policy, all non-rated officers from command of flying units. This policy was changed in 1997 when air battle managers were allowed to command AWACS flying units; but air battle managers were given rated status in 1999, making the

point somewhat moot. The current policy is only rated officers will command flying units. Furthermore, it is unlikely that a navigator or air battle manager would command a flying unit that did not fly aircraft with his specialty. Nevertheless, the replacement of the statutory ceiling with a glass ceiling indicates an increased status and the long-term potential for air battle managers, one of the core C4ISR career fields, to rise to the most senior ranks. Furthermore, on the issue of wings, which is not quite the same thing as ratings, but close, space/missile wings, or *swings*, were authorized in FY2006. The *swings* symbolize inner core status, but not an aeronautical rating. The elevated status recently afforded to air battle managers and space/missiles is important because it signifies the elevated status of C4ISR in general since air battle managers and space/missile officers comprise a large part of C4ISR personnel.

The third issue concerned the heavy reliance on the Aviation Cadet Program to provide flying officers from the World War II buildup into the Vietnam War. The program cemented the correlation between piloting and officership since flying skill, not education or experience, became the criterion for officership. Flying was the aviation cadet's ticket into the profession as well as the source of his flight pay, status, and enhanced promotion opportunities. If piloting was the membership qualification as well as the key to the inner core of the profession, it was only natural that pilots be overrepresented in the general officer ranks. In addition, the emphasis on flying has led to a more equitable distribution of general officers in terms of commissioning sources. Air Force Academy graduates have not achieved the dominance of general officer ranks



that West Point graduates once did. In fact, the Air Force Academy seems to have perpetuated many of the heroic warrior perspectives one would have expected from graduates of the Aviation Cadet Program, instead of the visionary warrior perspectives one would have expected from service academy graduates.

The corporateness section then examined the officer corps' tradition of carrying an active duty pilot reserve cloaked in non-pilot billets. Although the extent of this force has been decreasing, the flight pay and bonus systems appear to have encouraged pilots to remain in the officer corps long after their prime flying days are over and to take senior billets that do not require flying skills. This also contributed to the overrepresentation of pilots in the general officer ranks. In addition, the examination of the promotion system revealed a promotion system bias in favor of pilots and rated officers at the field grade level. The bias at the general officer level was already apparent. At the field grade level, the bias was more pronounced in the below-primary-zone promotions, which is to be expected since this small, select group of officers are generally believed to be in the grooming process and inside track for the inner pool of potential brigadier generals. Consequently, the promotion system bias also contributes to the overrepresentation of pilots in the general officer ranks.

The manuscript then moved to its final part. Part four analyzed large amounts of general officer sample data, categorized into several variables that potentially indicated the evolution of visionary warrior perspectives within the general officer corps. The data on the initial and in the apparent Air Force Specialty (Career Field) indicated that

as the number of non-pilot line general officers has increased, so has the diversity of these officers in terms of the career fields. This demonstrated a growth in the visionary warrior perspective since these non-rated career fields were no longer perceived as places to which general officers could turn for specialist advice. Instead, officers from these career fields were being accepted into the general ranks, i.e., into the inner core of the profession.

The flying and hot stick data indicated that there was no emphasis on flying and combat hours in official general officer biographies until the Vietnam War. However, by the later samples, a statement on one's total flying hours and combat sorties appeared to be mandatory. This had the effect of highlighting the absence of the statement in non-rated general officer biographies. This trend indicated a growth in at least the appearance of the heroic warrior perspective among general officers, even as the percentage of non-rated officers was increasing. On the other hand, the situation was more complicated with respect to the hot stick sub variable since both heroic and visionary warriors could point to the increasing importance accorded to Fighter Weapons School graduates and Forward Air Controllers (FACs) as evidence of the acceptance of their perspectives. However, since actual pilot skills were such a minimal part of the FAC job, it was clearly visionary; the Fighter Weapons School's name change to simply the Weapons School matched the change in its curriculum to a much more C4ISR integrated approach to warfare.



The more recent sample biographies also appear to have required a statement on the officer's command history. This is particularly noteworthy because command of a squadron, group or wing has lost all combat significance since at least the Vietnam War. The modern positions of higher-level combat leadership are found in positions of responsibility in the visionary CAOC and in the C4ISR system. However, the officer corps remains fixated on the squadron, group, and wing structure, which appears to foster the heroic warrior perspective. On the other hand, non-rated officers could also make mandatory statements on command, although their commands would be non-flying. In addition, command experience was not as prevalent as one might think. The sample data indicates that less than 60% of general officers per sample had wing-level command. Furthermore, the percentages of general officers reporting their first or only wing-level command in non-flying increased across the samples, as did the percentage reporting their first or only flying wings being something other than the traditional bomber or fighter wing. These were all indications of a shift from the heroic to the visionary warrior.

Information on one's professional military education has also become a required statement in the official biographies. Professional military education is important because it concerns the learning of professional knowledge, which forms the basis of a profession. It is particularly important in the case of military officers because the knowledge is not front-loaded as in medical or law school. Instead, in the military, it is distributed across an officer's career, theoretically in a building block approach that

makes use of the officer's experience. If officers can become members of the profession's inner core without attending the professional military education courses, then there would appear to be no professional knowledge, and probably no profession. Furthermore, since professional military education deals with strategy, operational art, and civil-military relations, and not technical skills like flying, professional military education is inherently visionary. Consequently, it was no surprise that over the course of the sample period, attendance at senior service school appeared to become a prerequisite for promotion to general officer rank. The trend for attendance at intermediate service school lagged behind the senior service school curve, and in fact appears to have leveled out at 90% over the last three samples. In addition, the percentage of general officers who reported their first or only senior service school to be joint, i.e., either at the National War College or Industrial College of the Armed Forces, climbed steadily through the sample period to the point where it reached 49% in the 2002 sample. This indicated a broader visionary warrior perspective.

The data also contained two variables concerning the value that the general officer corps' places on broader perspectives in its ranks. The career broadening variable looked at duty tours that officers have served outside of their career fields, but still within typical career fields within the Air Force. The data indicated that only about one-third of the general officers reported at least one career broadening tour, which pointed to a rather stove-piped system of officer development until reaching general officer rank. It also indicated that the personnel system did not contribute to the



development of visionary perspectives for the majority of the general officers. Whether a pilot or an intelligence officer, the officer corps appeared to favor officers with narrow, focused experience in one field. The exotic characteristics variable looked at duty tours outside of the Air Force or more atypical tours such as serving as aides or in legislative liaison within the Air Force. Given the relatively small number of foreign exchange tours, it is surprising that many officers who served in these clearly exotic duty tours were promoted to general officer ranks. Their presence in the general officer ranks indicates that at a minimum, a foreign exchange tour is not the kiss of death. In fact, it may even be a desired characteristic since the general trend appears to be increasing. Even in the case of an exchange tour flying aircraft, foreign exchange tours indicate a visionary perspective since these officers displayed a sense of curiosity and a willingness to at least expose themselves to other perspectives and models of officership. In the case of the atypical tours within the Air Force, the most important observation on this nearness to the flag pole sub variable was the clear divergence between the 4-star and 1-3 star data. Although both showed increasing trends, by the 2002 sample, the percentage of 4-star general officers with a nearness to the flag pole tour was 78%, whereas it is only 50% for the 1-3 star general officers. Consequently, being near the flag pole in aide-type duties seems headed to becoming a prerequisite for 4-star rank. That implies a heavier weighting on political skills within the profession. There were also indications that that the general officer corps is attaching an increasing importance to legislative liaison tours, which if continued, would potentially signal a

shift away from the apolitical Huntington model. Finally, it was clear that the percentage of general officers who have served a tour on the faculty or staff of a professional-type training institution was marked by a generally declining trend. Passing on the profession's knowledge was becoming less valued within the officer corps, which is not a positive sign for the profession.

The manuscript also provided an in-depth examination of the increasing importance of C4ISR to the general officer corps as seen in a variety of C4ISR indicators in the general officer sample data. The trend was clear that the percentages of general officers with C4ISR career field codes were increasing. Furthermore, as the number of Air Force C4ISR officer billets climbed from 15% to 24% of the line officer billets between 1961 and 2002, the percentage of line general officers with apparent C4ISR Air Force Specialty Codes climbed from 1% to 10% across the 1963 through 2002 samples. The growth at both levels appeared to be systematic. However, the 15% under-representation in the general officer curve also appeared to be systematic. This is a tribute to the strength of the structural factors discussed in Chapters 7 and 8 that limit the advancement of non-pilot officers to general officer ranks. The manuscript also looked at the percentages of line general officers who reported serving in C4ISR jobs in the three rank categories of: lieutenant colonel and below; colonel; and general officer. The trend indicated a shift from the pilot colonel overseer of C4ISR technical specialists to an actual participation of rated officers in C4ISR at more junior ranks. When each officer was only counted a maximum of once across all three C4ISR rank categories,



roughly one-third to one-half of the general officers per sample historically had at least one C4ISR tour in at least one rank category. In the 2002 sample, 52% of the line general officers reported at least one C4ISR tour, which indicated broad C4ISR experience across the general officer ranks, far in excess of the 10% of the general officers with apparent C4ISR career specialty codes. The analysis of the trend of the increasing wear of non-rated badges by line general officers yielded a similar result. By the 2002 general officer sample, for example, the number of space and missile badges worn by general officers was approximately four times the general officers with apparent space or missile career specialties. This provided another indication of the ample evidence that the general officer corps has not only become increasingly aware of the importance of C4ISR, but has increasingly become more experienced in C4ISR and visionary forms of warfare.

### Implications

At the level of the interaction between professions, the history of the Air Force can be portrayed as follows. The predecessors to the Air Force officer corps developed an expertise in airpower, largely based on aircraft and flying. They gained experience in World War I. After the war, they saw strategic bombing as the embodiment of airpower, and worked to convince the public that strategic bombing was a new and vacant jurisdiction waiting for one or more professions to claim and occupy. Furthermore, the nation's survival depended on its ability to fill this new jurisdictional void, and since this new jurisdiction was independent of land and sea operations, the

new jurisdiction should be monopolized by an independent air force. Consequently, the new profession of airmen and the new jurisdiction of strategic bombing arose simultaneously and entwined. Events in World War II substantiated the claim, and the public accepted both the new jurisdiction and the independent Air Force's monopoly over it.

If there was going to be a new independent Air Force, it made sense to place most aircraft and aviation missions within the new Air Force. Bombers needed fighter escorts, fighters would defend the US from enemy bombers, and the whole range of aviation activities was generally under the Army Air Forces during World War II. Consequently, the Air Force was also given large parts in the jurisdictions of strategic air defense of the United States, tactical air and strategic airlift. It was also responsible to train pilots and navigators for the Air Force and to purchase and accept deliveries of aircraft for the Air Force and other services. This was also conceptually easy for society and the services to follow. Each service had a medium of sorts. The Air Force had the air. The Army had a near monopoly in the jurisdiction of ground warfare. The Navy and Marine Corps had a combined near monopoly over the maritime warfare jurisdiction, including the conduct of amphibious landings and waging war on ground near large bodies of water. In addition, it made sense for the Navy and the Marines to keep carriers and aircraft under their own control to support their operations. Of course, any attempt to assign professions jurisdictions creates tension at the borders of the



jurisdictions, and this was indeed the case within the Department of Defense established in 1947.

More important, however, new technologies were changing the nature of warfare and simultaneously affecting jurisdictions. For example, the unmanned bombers, long-range rockets, guided air to air missiles, and electronic warfare systems under development or in operational use at the end of World War II portended dramatic change in aerial warfare. Consequently, a new profession based on a monopoly jurisdiction over strategic bombing was destined for a rapid demise unless it could develop and broaden its jurisdictional basis. A profession cannot exist without a jurisdiction, i.e., without society's agreement that the profession provides a specific expert service that society needs and authorizes that profession to provide, either as a monopoly or as an oligopoly provider. Consequently, the Air Force officer corps sought to develop the unmanned competitors to the manned bomber and also to broaden the definition of its strategic bombing jurisdiction to include at least Air Force unmanned competitors. The new profession of Air Force officers also continued to compete against the officer corps of other services for bigger slices of its existing jurisdictions in strategic air defense, tactical air, airlift, aircrew training, and aircraft acquisition. Finally, the Air Force officer corps looked began to look to the emerging new jurisdictions such as space warning, satellite launch and control, and C4ISR.

The ICBM functionally negated both strategic bombing and strategic defense against bombers. The threat of Soviet ICBMs hitting Air Force strategic bomber bases

30 minutes after launch, and in even less time with SLBMs, could not be logically countered by Air Force bombers flying twelve hour or longer missions to Soviet destinations. Airborne nuclear alert aircraft could cut the times down somewhat, but created a host of command and control, logistics, and political issues. Furthermore, the downing of Francis Gary Powers by a Soviet SAM called into question the viability of bombers actually penetrating an integrated Soviet air defense system. Finally, it proved extremely difficult to shoot down an ICBM or its warheads, and the Air Force had already ceded the point, or local area, air defense mission to the Army. The Air Force had taken the long-range and large area air defense. In an aircraft-only world, the long-range air defense mission was ideal for air defense aircraft, leaving a minimal role to Army SAMs to pick up the few enemy bombers that made it through. Overall command and control as well as most actual combat would take place in the Air Force realm. However, in an ICBM world, point defense SAMS appeared to be the defense solution, although the technology was lacking for implementation.

Consequently, the newly independent Air Force of 1947 was quickly losing much of its *raison d'être* by the early 1960s. ICBMs were the new key to the strategic offense. Manned bombers ostensibly added political options and complicated Soviet defensive requirements, but ICBMs and bombers were both weapons of last resort, the weapons of Armageddon. Ground-based systems could detect inbound Soviet ICBMs, but nothing could prevent them from striking targets in the US. Without the strategic mission, the Air Force would be reduced to the tactical mission, which was by its very



nature intricately tied to ground forces. After all, the strategic bombing campaign was by definition independent of ground operations and plans, but tactical operations were tied to supporting ground campaign objectives and forces. Airlift was not an Air Force monopoly, nor was it likely that it could be. Tactical airlift and airborne operations were tied to ground operations, and strategic airlift competed with civilian air transport. Without dominance over any jurisdiction, the future of the profession would eventually be called into question. The Air Force broadened the definition of strategic bombing to include medium-range surface-to-surface missiles as well as ICBMs. The Air Force officer corps expanded beyond manned bombers, and indeed beyond manned flight itself. The Air Force officer corps also strove for dominance in space operations. Command and control, electronic warfare, and eventually the quest for precision, became key supporting functions for air operations that simultaneously reduced the role of the pilot in combat. Over time, however, command and control of air operations, and counter enemy command and control, began to become an expertise and a jurisdiction in its own right, a jurisdiction in which the Air Force officer corps claims a near monopoly.

Of course, the Air Force officer corps has not given up airplanes, but there also has been no creation of a medium-based space service, profession and officer corps. This is at least partly because there is a profession construct that logically bridges the gap between the Douhetian Air Force focused on strategic bombing, and the post World War II Air Force's relatively steady reductions in bombers, aircraft in general, and

pilots as well as the accompanying rise in C4ISR expertise and jurisdiction. That high-level construct is that “bloodless” or “clean” warfare is what the Air Force officer corps actually brings to the table. This abstract expertise is not tied to aircraft, or for that matter to missiles, rockets or satellites. Although founded on aircraft, it quickly accommodated the ether of radar and electronic warfare, easily assimilated the A-bomb, later incorporated intercontinental ballistic missiles, played a role in the development of information warfare, and now proselytizes effects-based operations.

The Air Force has been historically led by men pursuing the vision of bloodless, or clean, war. This is what sets the officer corps of the Air Force apart from those of the Army, Navy and Marine Corps. The Army is stuck on the ground, be it in trenches, maneuver warfare, or low intensity conflicts. Combat occurs between groups of people at relatively close quarters. Enemy soldiers, non-combatants and terrain pose obstacles to reaching goals, which are defined in terms of controlling territory and people over time. The Navy and Marine Corps have the littoral and the blue ocean. Battle is waged by large groups of men, from and against other ships or shore installations. Naval forces can blockade an enemy, control sea-space for specific periods of time, or attack from the sea. Once the Marines are deployed, however, they largely face the same conditions as the Army. The Air Force, on the other hand, has always offered the promise of a cleaner, less bloody war, and its methods are not restricted to specific geographic conditions. Instead of slugging it out on the ground or along the littoral, the Air Force slips past the old ways of war and with “surgical strikes” suppresses or



destroys the enemy's command and control over its forces and population, the enemy's transportation lines of communications, and the enemy's ability to wage war, thereby quickly bringing an end to the war. In the ideal, this could be done without resorting to the bloody traditional forms of warfare. Although historically conceived of with respect to aircraft, the implementation does not require aircraft. Missiles, electronic warfare, computer attacks or information operations might achieve the same effects. In its most abstract form, it is simply using technology and machines to wage war at such a level of effectiveness and efficiency that it prevents or minimizes the need for soldiers to slug it out on the ground or sailors to slug it out at sea.

The Air Force cannot give up its domination of the jurisdiction of long-range, precision strike—the ability to attack anywhere at anytime, within hours, or potentially minutes, of a decision to attack. It is the abstraction of the Air Force's core historical justification for existence, the modern evolution of the old strategic bombing. Whether conducting daylight “precision” bombing over Europe in WWII, firing laser-guided missiles in Iraq, or using ICBMs to counter-force target potential enemy forces; accuracy has always been an Air Force hallmark. This in turn requires the technology to achieve evermore accurate weapons as well as the intelligence to aim them at the right places at the correct times. This combination of intelligence and technology also opens the door to information operations and effects-based operations. The Air Force officer corps cannot let another profession develop an expertise in information attack or effects-based attack independent of Air Force airplanes, missiles, or C4ISR. Air Force

C4ISR is what makes the kinetic, electronic, computer or information attack possible—in terms of not only targeting, but also mission planning, execution, and feedback. Without it, the Air Force would have very limited claims in any jurisdiction, and without jurisdiction, a profession is not a profession.

This is not meant to imply that there are no deaths or destruction. In fact, many would argue that it is a euphemistic description of something that is quite the opposite. However, the emphasis is on the relative bloodless nature of Air Force strikes in comparison to a ground or naval campaign to achieve the same results. Rather than fight the whole way in to the enemy's political center of gravity to compel surrender, like peeling an onion from the outside and going through each layer, airpower, and now effects-based operations offer the ability to attack the center from the very beginning. The WWII bombing campaigns, Hiroshima and Nagasaki, Operation El Dorado Canyon, Dessert Storm, Kosovo, and current operations in Afghanistan and Iraq were all designed to make full use of this principle.<sup>314</sup> It minimizes US ground and naval casualties, non-combatant collateral casualties, and even casualties to enemy forces from the perspective that bloody combat at each layer of the onion is avoided. However, it is also arguable that airpower, information warfare and effects-based operations also, as a byproduct, tend to push the envelope of common understandings of warfare. For example, strategic bombing moved the terror and destruction of the battlefield to cities deep in the enemy's interior, far removed from the front-lines. If a

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<sup>314</sup> Operation El Dorado Canyon was the 1986 air strike against Libya.



country were to embrace the concept of using information warfare, computer attacks or 30 minute conventional missile strikes in “peacetime,” then the contemporary concepts of peacetime and war would become meaningless. Warfare could rage continuously under the illusion of peace since anything could conceivably be done to create a desired “effect” among allies or enemies.

A second part of the concept is the “clean” nature of the warfare. Warfare is conducted from a distance, and targets tend to be “things,” not people. The Air Force destroys and disrupts railway yards, critical defense industries, communications nodes and chokepoints, command and control infrastructure, SAMs, and even aircraft—not people, *per se*. ICBM crews and bombers with stand-off weapons never see their targets. At the tactical level, the Air Force frequently targets bunkers, bridges, specific parts of specific buildings, and tanks and other vehicles. In air-to-air combat, the tendency has been to move towards beyond-visual-range (BVR) engagements, where the enemy aircraft is a blip on the radar scope. Although there are obviously people in the bunkers, command posts, tanks, and planes, they are few and most likely key combatants, whose deaths increase the chaos in the enemy ranks and consequently, over the long-run, reduce casualties. Furthermore, the Air Force takes other steps to minimize “collateral damage” (non-combatant materiel and casualties). For example, during the Kosovo campaign, bridges were attacked at night, when the risk of noncombatant casualties was lower. It is not until one gets to the “low and slow” level of close air support, e.g., from an A-10, AC-130 or Predator UCAV, that the human

nature of the targets emerges. In general, however, modern Air Force warfare takes on the aura of a video game. Furthermore, the air and missile crews do not generally see the results of their attacks first-hand, which perhaps further isolates them from the bloody and dirty aspects of war. This is dramatically different from the perspective of an infantryman, but possibly not far removed from that of other longer-range military platforms such as artillery or ships. Finally, the Air Force's careful selection of "gun camera" tapes to release to the news media tends to highlight both the precision and the "clean" nature of modern air attacks, which buttresses Air Force officer corps claims to dominance or near monopoly in this jurisdiction.<sup>315</sup>

The Air Force has been pursuing precision munitions since the late 1940s with respect to air-to-air missiles, surface-to-air, air-to surface, and surface-to-surface missiles. At the strategic level, conventional precision munitions offer the specter of being able to attack a nuclear-armed enemy and destroy large parts of his nuclear capabilities, while retaining all of one's own. Consequently, preponderance in long-range conventional precision capability could potentially make a nuclear stalemate meaningless. At the tactical level, precision supports the general clean/bloodless concept since it brings a victorious end to the ground war faster, thereby minimizing casualties. In addition, precision weapons also minimize collateral damage and enhance claims of legitimacy by waging this type of war. It also contributes to the blurring of

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<sup>315</sup> Navy and Marine aircraft also can fire precision guided munitions, but it is not clear that the general public makes distinctions beyond the general medium-based view of the services. Airplanes are in the Air Force, ships are in the Navy, and tanks in the Army.



strategic and tactical perspectives in the Air Force officer corps since the expertise shifts away from a basis in airframes to one of weapons, C4ISR, and effects. Finally, it offers the Air Force more leverage in its competition with the Army, Navy and Marine Corps in the shared jurisdiction of tactical warfare. A major implication of this trend, however, is that there will be a continued reduction in the importance of manned piloting within the Air Force officer corps on the one hand, but a need to develop combat commanders, staffs, and future Air Force leaders in this less pilot-dominant world. However, this will be a difficult task for the officer corps since it has had great difficulty overcoming its pilot-centric focus and the perceived connection between flying and leadership skills. If flying is no longer the proxy for leadership, what will the officer corps use to assess *military genius*? Although C4ISR scenarios are probably the way to go, moving from theory to a new practice in the face of the structural impediments will be a difficult transition.

#### Applicability Beyond the Air Force Officer Corps

The model, methodology and arguments laid out in this manuscript have obvious applicability beyond the manuscript's narrow scope of the Air Force officer corps. The first logical place to turn for further application of this approach is the other military services since the model already contains the concept of jurisdictional competition between the individual service officer corps. Consequently, the model could be used as a basis for examining the evolution of another service's officer corps' composition, sense of expertise and jurisdictional struggles. The model and

methodology could also serve as the basis for comparative studies between one or more services in the same nation or between the officer corps of the same branch of service in different nations. This approach could be used to examine the different, service-specific perspectives towards a common issue such as the changing locus of decision-making in combat operations. In addition, the model could be used to examine the factors at play from the sense of profession as two or more service officer corps compete within a specific jurisdiction like tactical war. Furthermore, the approach might provide interesting insights into the basic question of the military services themselves and whether there is one military profession, as is usually ascribed, or whether there actually are multiple and competing military services as this manuscript propounds. In the second case, the evolution of a potentially separate space or information service would be an interesting study.

Although the other military services seem to be the first logical extension of this manuscript's approach, that is probably too much in-the-box thinking. If one returns to the model and thinks of the various groupings of people performing certain types of work, then there are actually several spheres, each representing a profession or grouping of people, floating in space. Spheres may remain intact in the competition for jurisdiction and settle for partial shares. However, like soap bubbles, as the professions compete, the personnel and missions at the peripheries may become entwined, and the dominant may totally absorb the other profession. Conversely, as was the case with the Air Force officer corps, a bubble might develop within an existing profession's bubble,



and then pop off, forming its own bubble. It is also theoretically possible for a new profession's bubble to seemingly pop out of nowhere (non-profession space) with personnel and expertise to fill a new jurisdiction. If one looks at places where Air Force officer corps missions and/or personnel are entwined with those of other organizations, then the scope of applicability for this manuscript's approach increases dramatically beyond the military box. In terms of mission overlap, nothing is clearer than the similarity in work performed by Air Force cargo aircraft and that performed by airlines, charters, and air freight companies, many of which perform services for the Air Force under contract. The model used in this manuscript might provide the structure for an analysis of why these companies are not typically seen as competing with the Air Force. Is the perception driven simply by the perception that professions and companies are in different boxes and therefore do not compete? If the type of work overlaps, and some of the personnel overlap (many Air National Guard and Air Force Reserve officers fly for these types of companies in their civilian capacity), does it all boil down to the social responsibility versus profit motive that keeps them in separate categories? In the governmental world, the Air Force officer corps provides personnel and expertise, yet also competes for part of the jurisdiction with agencies like the Central Intelligence Agency and NASA as well as with the many joint military agencies like the National Reconnaissance Office, National Security Agency, and Defense Intelligence Agency. What separates a civilian employee in one of these agencies from an Air Force officer performing the same work? Such questions lead to the bigger out-of-the-box question

of what exactly defines modern warfare, and what groups have which jurisdictions within it.

Of course, one need not keep coming back to issues of warfare and the military. The general approach used in this manuscript is applicable to the study of any organization or type of work that is potentially a profession. The issues of expertise, corporateness, social responsibility, jurisdictional competition, and the changing nature of each as they interact is apparent in most professions or profession-type work. For example, within a law practice, there is not a struggle between heroic and visionary warriors. However, there is a tension, or struggle between the traditional, litigating lawyer and the non-litigating lawyer. The litigating lawyer is similar to the heroic warrior. He has status, exercises the traditional expertise, and seems to exemplify the lawyer's jurisdiction. However, the more visionary warrior non-litigating lawyer potentially brings more money into the law practice, offers a new expertise that appears to be a natural evolution beyond the traditional, and is staking a claim for lawyer participation in this expanded jurisdiction. Of course the expanded jurisdiction may involve competition with accountants, financial advisors, arbitrators, and other fields. A similar situation prevails in public accounting firms where the traditional professional bastions of auditing and taxes struggle against the more visionary and lucrative consulting and financial advisory aspects of a practice. In addition, the model could also be used in the public sector. In the State Department, for example, the division between the Foreign Service Officers and Government Service employees could also be



cast as one of heroic versus visionary against the backdrop of changing expertise, corporateness, and even jurisdiction, as more entities seek to compete for a piece of the foreign affairs jurisdiction.

### Conclusion

The model of profession and the methodology used in this manuscript provides a good explanation for the puzzle of why 60% of Air Force general officers are still pilots when pilots comprise just 20% of the officer corps. Structural factors, which were largely the result of the Air Force officer corps' strategies to achieve independence as a profession, explain most of the difference between the values. In addition, the manuscript shows that the expertise and jurisdiction of the Air Force officer corps has evolved significantly over the course of the independent Air Force's existence, which explains the overall decrease in the percentage of pilots in both the officer corps and in the general officer ranks. C4ISR is arguably now the officer corps' most important expertise and jurisdiction. The Air Force does not and cannot conduct operations without C4ISR, and C4ISR forms the springboard for the officer corps' further evolution with visionary, non-piloted and/or non-flying forms of warfare.<sup>316</sup>

Furthermore, the model and methodology appear to be applicable to further study of

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<sup>316</sup> In fact, the Air Force's announcement of a new mission statement in December 2006 is an affirmation of this manuscript. The old mission statement was: "To defend the United States and protect its interests through air and space power." The new mission statement includes the phrase: "To fly and fight in air, space, and cyberspace." See Bruce Rolfsen, "Cyberspace deemed new warfare theater," Air Force Times 19 Dec 2005: 13; and Bruce Rolfsen, "Cyberspace: the next frontier, Concept of 'cyber command' still in its infancy," Air Force Times 20 Mar 2006: 10.

professions and profession-like groups in the military, as well as in the public and in the private sectors.



## Appendix A - General Officer (GO) Samples

### Basic Methodology

Since my puzzle revolves around Air Force general officers, it would be useful to look at qualitative-type variables in the backgrounds and experiences of general officers. This information might provide clues as to what the general officer corps valued, and therefore, rewarded with promotions to its ranks. Since there is no readily accessible data of this type available, I decided to do an analysis of general officer biographies that would roughly span the same time frame as my analysis of the annual USAF Statistical Digests, which is the period between 1948 and 2003. The total number of general officers is quite large, on the order of over 300 a year with considerable duplication year-to-year. In addition, since I wanted to look at long term trends, it seemed more logical to break the analysis into periodic year groups instead of analyzing the total pool, or random samples drawn from the total pool. Consequently, I decided to create a series of swaths of Air Force general officers for comparison and trend analysis. However, it was difficult to find lists of all Air Force generals on a yearly basis. Consequently, I decided to use the Air Force section of *Pentagon (DoD) Phone Book* editions to generate samples. Only the Air Force section was usable since most editions did not label officers in the Office of the Secretary of Defense or in the Joint Staff by service. Although my original intent was to run in five-year increments from 1948 through 2003, the phone books did not list officer names with the staff positions until 1951 and returned to the no-name practice after 2002. Consequently, I

ran at five-year intervals from 1953-1998, and added 1951 and 2002 as the bookends. I also decided to include MAJCOM commanders to pick up a larger set of the four-star Air Force general population, much of which resides outside the Washington, DC area. This pseudo-random sampling yielded an average of 86 Air Force general officers per swath. Although not truly random, the samples are consistent and the skewing is not done by me, but by whomever in the Air Force decided which names to place in the Pentagon phonebook. The phonebook obviously emphasizes the DC area and positions on the Air Staff. However, this is the brain of the Air Force, and consequently, the best cross-section of Air Force general officers. Although this sampling misses all of the operational wing commanders scattered around the globe, many should cycle through Washington sooner or later. In any event, this technique appeared to be the best available option and the Air Staff should be the most interesting case for analyzing pilot and non-rated generals. The Air Force website provided biographies for most of the general officers in the swaths.<sup>317</sup> The biographies were then coded and loaded for analysis.

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<sup>317</sup> Most of the Air Force general officer biographies used in this manuscript were gathered over the course of several months and are available at the Air Force Website: <<http://www.af.mil/bios>>. If a biography for a particular general was not available on line, USAF Historical Study No. 91: Biographical Study of USAF General Officers, 1917 – 1952 was checked. If the biographic data was there, it was included in the manuscript database. See Robert P. Fogerty, United States Air Force Historical Study No. 91: Biographical Study of USAF General Officers, 1917-1952, Maxwell Air Force Base, Alabama: USAF Historical Division, Air University, 1953.



### Indicators of the Sampling Validity

The samples are large enough to provide meaningful data on the population of Air Force general officers. If measured in terms of the individual samples as a percentage of the total Air Force general officer population in the respective sample year, the average participation across all twelve samples is 25%. The 1951 sample with 34% of the total Air Force general officers included has the highest participation. The 1968 and 1973 samples, each with 21% of the total Air Force general officers included, are the lowest. In terms of total numbers, the 1958 sample has the most participants at 105, and the 2002 sample the lowest at 67. The average number of participants is 86 across all the samples.

The sampling method of using the *Pentagon Phone Books* captures an over-proportional number of non-line general officers because they are over-represented at Air Force Headquarters. Chart A-1 (GO Samples: Comparison of Sample Compositions to Total General Officers) provides a comparison of the composition of the general officer samples to the composition of the total Air Force general officer population. The data shows that the percentage of pilots and the percentage of non-rated (not pilot or navigator) line officers from the total general officers in the sample are both under-representative, while the percentage of navigators in the samples is relatively close to the percentage of navigators in the total general officer population. However, comparing the composition of the line general officers in the samples to the composition of the total Air Force line general officer population yields Chart A-2 (GO

Chart A-1: GO Samples: Comparison of Sample Compositions to Total General Officers

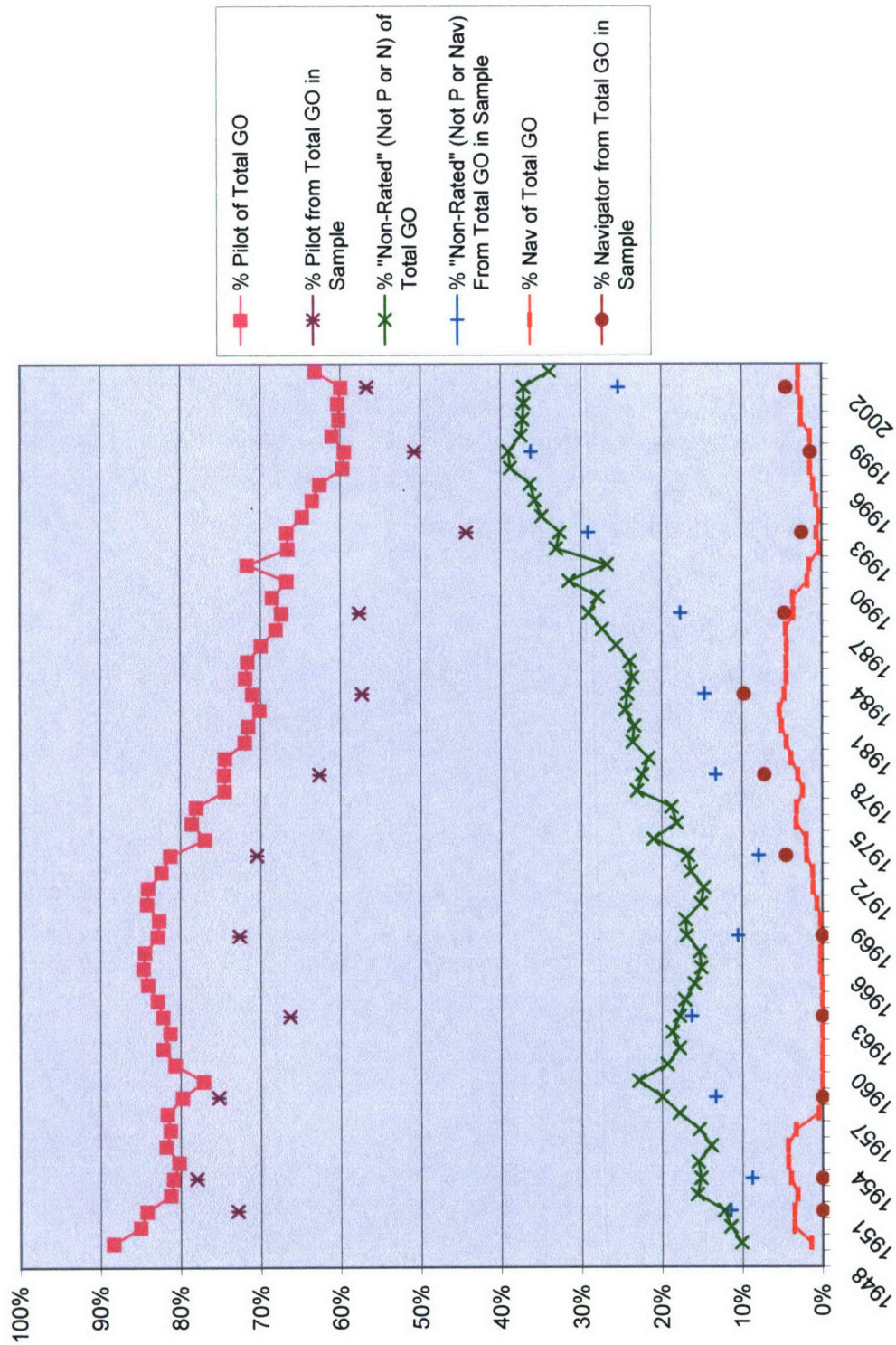
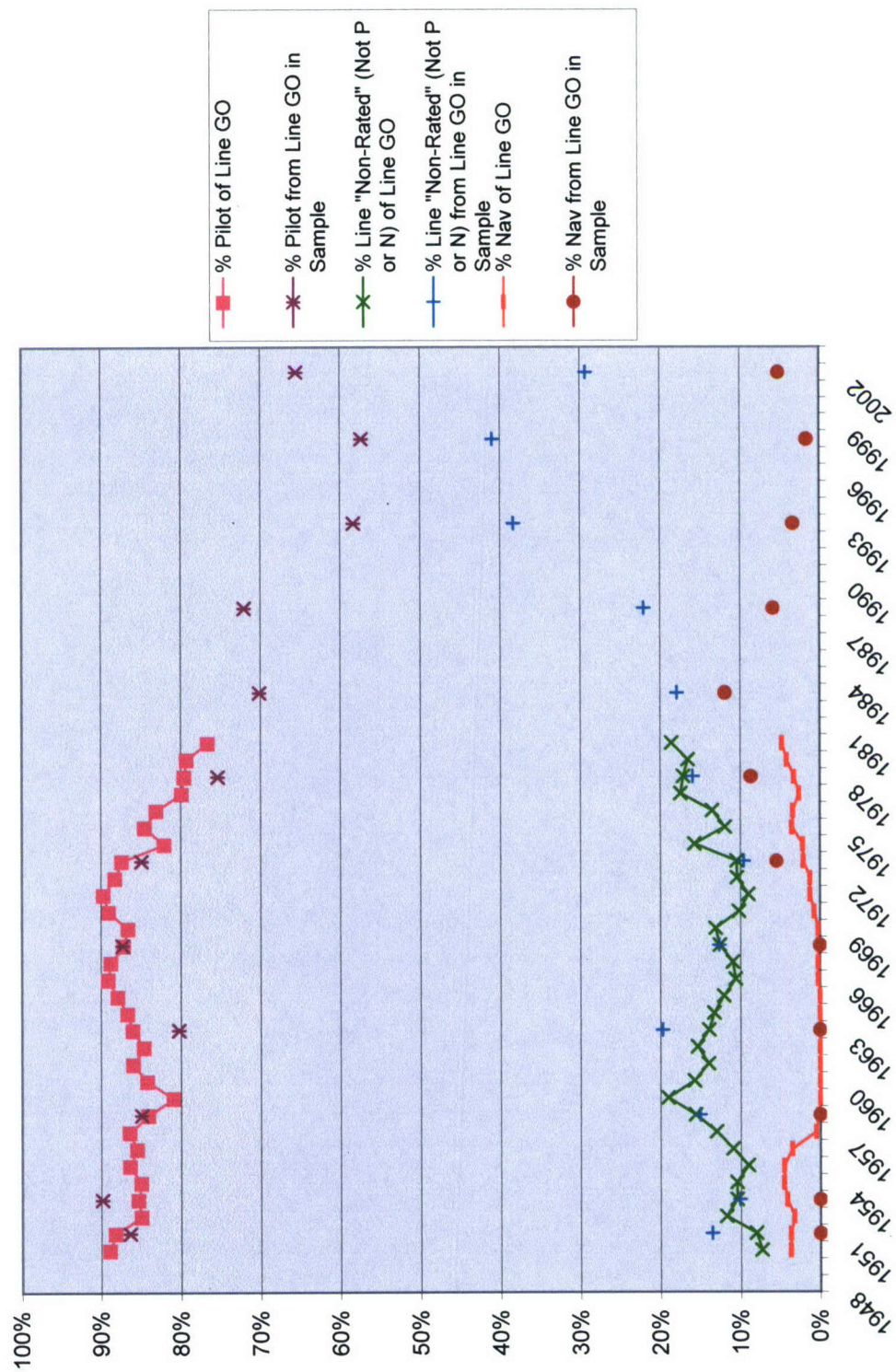




Chart A-2: GO Samples: Comparison of Sample Compositions to Line General Officers



Samples: Comparison of Sample Compositions to Line General Officers). This chart, which contains information on the line general officer population from FY1950 through FY1980, shows a closer alignment of the sample and population data for pilot and non-rated (not pilot or navigator) line general officers.<sup>318</sup> Furthermore, the absolute value of the difference in the percentage of pilots from line general officers in the sample and in the population over the period of the 1951 through 1978 samples varies from 0% to 6%. However, the absolute value of the difference in the percentage of pilots from total Air Force general officers in the sample and in the population over the period of the 1951 through 1978 samples varies from 3% to 16%. Consequently, the sample data is much more representative of the line officer population than the total officer population. The same is true for non-rated line officers (not pilot or navigator). The absolute value of the difference in the percentage of non-rated (not pilot or navigator) line general officers from line general officers in the sample and in the population over the period of the 1951 through 1978 samples varies from 0% to 6%. However, the absolute value of the difference in the percentage of non-rated (not pilot or navigator) line general officers from total Air Force general officers in the sample and in the population over the period of the 1951 through 1978 samples varies from 1% to 9%. Consequently, the over-representation of non-line officers forces an under-representation of primarily pilot general officers, followed by non-rated (not pilot or navigator) line general officers.

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<sup>318</sup> The USAF Statistical Digest series stopped providing data on line versus non-line general officers after FY1980, and I do not have any reason to believe that the trends shown on the graphs would change if line general officer data was found and added to the charts for the 1983 through 2002 samples. Non-line officers continue to be over-represented at Headquarters, Air Force.



The small number of navigators in the general officer samples and populations means that it is difficult to get a big difference between the percentage of navigators from the line and total Air Force general officer samples and populations. The absolute value of the difference in the percentage of navigators from line general officers in the sample and in the population over the period of the 1951 through 1978 samples varies from 0% to 5%. However, the absolute value of the difference in the percentage of navigators from total Air Force general officers in the sample and in the population over the period of the 1951 through 1978 samples varies from 0% to 4%. Consequently, I feel confident using the sample data in the case of line general officers.

#### General Officer (GO) Biography Sample Coding Procedure

List all officers identified as general officers in the “summer” editions of the Pentagon Phonebooks for '51, '53, '58, '63, '68, '73, '78, '83, '88, '93, '98, 2002. Search Air Force online general officer biographic database for bios on each GO identified. If no biography available, search Google and Air Force Office of History biographic references for biographic material. If none available, check for reasonable typos. If still no biographic information, discard as typographic or administrative error.

Add the three and four-star major command (MAJCOM) commanders from *Air Force Magazine* for the same time periods. If *Air Force Magazine* lists MAJCOM commander changes in the summer, chose the spring (i.e., the previous) commander. Get bios from Air Force online general officer biographic database.

Except where noted otherwise, the intent is to code information from the biographies based on the officer's experience in the ranks of 2<sup>nd</sup> lieutenant through colonel, not as a general. If no information on dates of rank is contained in the biography, the default is to assume the officer becomes a colonel at 20 years of commissioned service and a brigadier general at 25 years of commissioned service.

The phone books are being used to generate names for the sample. Consequently, biographies of officers contained in the phone book will be used, even if the biography indicates that the officer moved on to a different position or retired by the time of the phone book edition. Not all the biographies are updated; so there is no way to tell on many of them.

- Name: Last, first, middle initial
- Rank: Current rank as listed in phone book or *AF Magazine* at time of sample (May be referred to in biography as *temporary rank*)
- "Component:" [USAFR, ANG, Medical, JAG, Chaplain, Line]
  - Purpose: To weed out all but Line officers; If a GO is not line, no further coding except for current job
  - USAFR - reserve serving in USAF Reserve billet/capacity, even if on extended active duty
    - Intent is to weed out those serving as top USAFR leadership, not those officers with a non-regular commission serving extended active duty (EAD) in USAF positions with no connection to USAF Reserves.
  - ANG - Air National Guard member
    - Intent is to weed out those serving as top ANG leadership, not those officers with a non-regular commission serving EAD in USAF positions with no connection to ANG
  - Medical - Medical/Dental/Doctor/Nurse/Biomedical Services/Veterinarian etc.
  - JAG - serving in Judge Advocate Corps, i.e., lawyer serving as a lawyer
  - Chaplain - chaplain
  - Line - Not falling into the above categories
- Flying Hrs: [none, small, medium, large]
  - None - none listed in biography
  - Small - under 1000
  - Medium - between 1000 and 2500
  - Large - over 2500
- Combat Hrs/Sorties: [Yes Small, Yes Medium, Yes Large, No]
  - Small - < 40 sorties or < 100 hrs
  - Medium - 40 - 150 sorties or 100 - 250 hrs
  - Large - > 150 sorties or > 250 hrs
  - No - none listed in biography
- "Hot Stick:" [FWS, T-Bird, TPS, Trophy, Astro, Ace, ACTS, Not] (Multiple Entries Possible)



- FWS - Fighter Weapons School or any weapons school (grad or faculty), also if reference to *weapons and tactics* officer; after 1986 not necessarily a flyer
- T-Bird - Thunderbird pilot, maintenance, or squadron commander, or other aerial demonstration team
- TPS - Test Pilot School grad or faculty, also count vague references to flight testing which might include experimental airplanes (labeled X-something) and IOT&E (Initial Operational Test and Evaluation)
- Trophy - set aviation records, win aviation trophies in conjunction with personal flying ability; count crew trophies
- Astro - Astronaut rating of some sort; Reference to astronaut program; Selection to astronaut program also counts
- Ace - shot down 5 airplanes or labeled as ace
- ACTS – attended or graduated from Air Corps Tactical School
- Not - nothing impressive listed in biography
- Not a “Hot Stick:” [POW, FAC, Not] (Multiple Entries Possible)
  - POW – Prisoner of War
  - FAC – Forward Air Controller (FAC)
  - Not – Nothing listed indicating not a hot stick
- Checkmate: [Yes, No]
  - Yes - Was in “Checkmate,” the “Black Hole,” or planned major air campaign
  - No – No mention of any of these activities
- Sqd Cmd: [Yes FB, Yes FF, Yes FT, Yes FO, Yes O, Yes T, Yes MS, Yes OTH, No] Code first squadron command position chronologically
  - Yes FB - Flying Bomber Squadron Command
  - Yes FF - Flying Fighter Squadron Command; could be labeled as “TFS” (tactical fighter squadron) or “FIS” (fighter interceptor squadron)
  - Yes FT - Flying Training Squadron Command
  - Yes FO - Flying Other Squadron Command (e.g., tankers, recce, airlift, etc)
  - Yes O - Operations Squadron Command, non-flying but still operational such as missiles, space, weapons controlling, etc
  - Yes T - Training Squadron Command, non-flying but still a training squadron; could be labeled “TTS” (Technical Training Squadron)
  - Yes MS - Maintenance or Support Squadron Command; could be labeled as “FMS” (field maintenance squadron), “EMS” (equipment maintenance squadron), “AGS” (aircraft generation squadron), “CRS” (component repair squadron)
  - Yes OTH - Any other non-flying squadron command

- No - No squadron command listed
- Group Cmd: [Yes FB, Yes FF, Yes FT, Yes FO, Yes O, Yes T, Yes MS, Yes OTH, No] Code first group command position chronologically
  - Yes FB - Flying Bomber Group Command
  - Yes FF - Flying Fighter Group Command
  - Yes FT - Flying Training Group Command
  - Yes FO - Flying Other Group Command
  - Yes O - Operations Group Command, non-flying but still operational such as missiles, space, weapons controlling, etc
  - Yes T - Training Group Command, non-flying but still a training group
  - Yes MS - Maintenance or Support Group Command
  - Yes OTH - Any other non-flying Group command; include *operations groups*
  - No - No Group command listed
- Wing Cmd: [Yes FB, Yes FF, Yes FT, Yes FO, Yes O, Yes T, Yes MS, Yes OTH, No] Code first wing command position chronologically
  - Yes FB - Flying Bomber Wing Command
  - Yes FF - Flying Fighter Wing Command
  - Yes FT - Flying Training Wing Command
  - Yes FO - Flying Other Wing Command
  - Yes O - Operations Wing Command, non-flying but still operational such as missiles, space, weapons controlling, etc
  - Yes T - Training Wing Command, non-flying but still a training wing
  - Yes MS - Maintenance or Support Wing Command
  - Yes OTH - Any other non-flying Wing command
  - No - No Wing command listed
- Center Cmd: [Yes + rank, No] (Multiple entries possible)
  - Yes + rank (Lt Col, Col); if states commanded Center or equivalent but no rank, then say "yes"
  - No - No reference to command of a Center below general officer rank
- Program Dir / Dir Program Office: [Yes + rank, No] (Multiple entries possible)
  - Yes + rank – (Lt Col, Col); if says in program, program director, program office, etc., must have to do with acquisitions or SPO (system program office)
  - No - No reference to specific acquisitions' programs or SPO or program office prior to becoming general officer rank
- Nearness to Flag Pole: [ASTP, Aide, SG, Far] (Multiple entries possible, but only using different categories, i.e., do not list multiple Aide assignments)



- ASTP - Air Staff Training Program (aka ASTRA or “intern”); Officers serving on Air Staff, Joint Staff, or OSD (Office of Secretary of Defense) very early in careers, usually as captains, usually only for one year
- Aide – Aide, adjutant, executive officer, etc. to a GO or equivalent, or Military Assistant (MA), Special Assistant to Chief of Staff (SPACOS), etc.
- Dad C – Father a colonel; and referenced in biography
- Dad G – Father a general; referenced in biography or obvious (e.g. Ryans)
- SG - CoSAF Staff Group or any MAJCOM Staff Group
- Far - Far away from the flag pole, none of the above mentioned in biography
- Initial AFSC: [P, N, ABM, Missiles, Space, ATC, Ops, Log/Maint, ACQ, Intel, Comm/Electronics, Personnel/Admin, Finance, Scientist, Support]
  - Initial Air Force Specialty Code, i.e., occupational specialty. Casual status jobs (up to a year at times) while awaiting training slots do not count. Initial jobs typically require some kind of training and typically last at least a year
  - P - Pilot
  - N - Navigator Nav/EWO (electronic warfare officer)/WSO (weapons system officer)/Bombardier, etc.
  - ABM - Air Battle Manager
  - Missiles - Missile operations or maintenance
  - Space - Space, only count operator or maintenance tours, not space acquisitions
  - ATC - Air Traffic Control
  - Ops – general operations, including Army tours in infantry, artillery, etc.
  - Log/Maint - Logistics/Maintenance
  - ACQ - Acquisitions
  - Intel - Intelligence
  - Comm/Electronics – Communications, Electronics, and Computers
  - Personnel/Admin – Personnel, Administration, etc.
  - Finance – Finance, Comptroller, Statistics
  - Scientist – Research and Development work as scientist, not program manager
  - Support - everything else
- Apparent AFSC: [P, N, ABM, Missiles, Space, ATC, Log/Maint, ACQ, Intel, Comm/Electronics, Personnel/Admin, Finance, Scientist, Support]
  - (In the following rank order, only one choice allowed)
  - P - Pilot, any pilot wings or has flown as pilot
  - N - Navigator, any navigator wings or has flown as Nav/EWO/WSO/Bombardier etc

- ABM - Air Battle Manager, any version of ABM wings/badge or multiple tours as ABM
- Missiles - Missiles, any version of Missile badge or tours in missile ops or maintenance
- Space - Space, only count operator or maintenance tours, not space acquisitions
- ATC - Air Traffic Control, any version of ATC badge or multiple tours in ATC
- Ops – general operations, includes multiple Army tours in infantry, artillery, etc.
- Log/Maint - Logistics/Maintenance, any version of Maint/Log badges or multiple tours in Log/Maint (broadly defined)
- ACQ - Acquisitions, any version of acquisitions badge or multiple tours in acquisitions
- Intel - Intelligence, any version of intelligence badge or multiple tours in intelligence
- Comm/Electronics - Communications Electronics & Computers, any version of communications, or electronics badge or multiple tours in Communications, Electronics, or Computers
- Personnel/Admin - Personnel & Administration etc., any version of personnel or administration badge or multiple tours in personnel/admin (broadly defined)
- Finance - Finance Comptroller & Statistics, any version of finance/comptroller badge or multiple tours in finance, comptroller, or statistics
- Scientist – Research and Development work as scientist, not program manager
- Support - everything else
- Career Broadening Prior to Colonel: [Yes Train, Yes Staff, No]
  - Yes Train - appears officer attended training course and/or served in the field
  - Yes Staff - anyone in any staff position different than prior experience except acquisitions; won't count operators that go to operations (J3) or planning (J5), maintenance people who go to logistics (J4)
  - Yes ACQ – served in staff acquisitions or acquisitions position if initial and apparent AFSC are not acquisitions
  - No - did not vary from career emphasis, i.e., staff tours stay in field or are in generalist positions
- Colonel Broadening: [Yes, No, Never, unknown]
  - Yes - Officer did not leave initial Air Force specialty code (AFSC) career-field track until rank of colonel or 20 years, but then does broadening



- assignments as a colonel (or in the 20-25 years of commissioned service if rank not clear or available), does not include school or professional military education (PME) (“*No Broadening Until Colonel, then Broadened*”)
  - No - Officer left initial AFSC before rank of colonel or before 20 years, permanently or for at least one tour (“*Broadened Prior to Colonel*”)
  - Never – Officer did not career broaden before rank of brigadier general or 25 years (“*Did Not Broaden Prior to GO*”)
  - unknown - information unclear or unavailable
- Current Job: [Current job title in phonebook or in *AF Magazine*]
- Badges: [Missile Ops, Missile, Space, Other Badges, No Pic, No Badges, Badges but unclear] (Multiple entries possible; Can be from text of biography or photograph)
  - Intent: Since only wings required to be worn, look to see who/how many officers wear other occupational badges and perhaps which badges
  - Parachutist – Parachute wings
  - *Missile Ops* - *Missile ops badge Merged into “Missile” below*
  - Missile - Missile Badge
  - Space - Space Badge
  - Other Badges - other badges
  - No Pic - no picture, picture does not show badge area, and no references to badges in text
  - No Badges
  - Badges but unclear
- Initial Education Level: [HS, B, M, PhD]
  - HS - High School
  - B - BA or BS
  - M - MA or MS etc
  - PhD - Doctorate
- Initial Education Major: [MS, BA, SS, AL, other, unknown]
  - MS - Math or Science (e.g., chemistry, biology, engineering, weather, etc.; includes generic service academy graduate with no major listed)
  - BA - Business Administration (e.g., Accounting, Finance, Management)
  - SS - Social Science (e.g., Psychology, Political Science, Sociology, History)
  - AL - Arts and Literature (e.g., English, Foreign Languages, Music)
  - other - whatever not mentioned above
  - unknown - information not available, or no college degree
- Highest Education: [HS, B, M, PhD]
  - HS - High School
  - B - BA or BS

- M - MA or MS etc
- PhD - Doctorate
- Commission Source: [Academy-WP, Academy-AF, Academy-NA, ROTC, OTS/OCS, Av Cadet, ANG, Other]
  - Academy-WP – US Military Academy (West Point)
  - Academy-AF – US Air Force Academy
  - Academy-NA – US Naval Academy (Annapolis)
  - ROTC – Reserve Officer Training Corps; Air Force, Army or Navy/Marine Corps variants
  - OTS/OCS - Office Training School/Officer Candidate School
  - Av Cadet - Aviation Cadet Program, Flight Officer Program, etc.
  - ANG
  - Other - Any other means, such as direct commissioning, or Unknown
- Intermediate Service School (Student): [ACSC, AFSC, No] First one chronologically
  - ACSC - Air Command Staff College, count ACSC, Army CGSC, Navy War College, and MC equivalent; Can be done by correspondence
  - AFSC – Armed Forces Staff College (Joint)
  - AFIT - Education with industry or Think Tanks, etc
  - No - No ISS experience listed
- Senior Service School (Student): [AWC, NWC, ICAF, No] First one chronologically
  - AWC - Air War College, include Army and Navy War College but not Joint; Can be done by correspondence
  - NWC - National War College
  - ICAF - Industrial College of the Armed Forces
  - AFIT - Education with industry or Think Tanks etc
  - No - No SSS experience
- Schools/PME faculty: [Yes, No]
  - Yes - faculty/staff at ACSC, AWC, NWC, ICAF, DCSC, AFA, ROTC, OTS/OCS, SOS, AFIT, ACTS
  - No - No faculty/staff experience
- Exchanges: [Yes OP, Yes PME, Yes OLM, Yes WHF, Yes US, No] If multiple exchanges, code one, using the following rank order.
  - Yes OP - Yes in an operational, maintenance, or support role with foreign military
  - Yes PME - Professional Military Education as faculty or student at foreign military school



- Yes OLM - Olmsted Scholarship, Fulbright, State Department, etc., where officer in “nonmilitary” setting
- Yes WHF - *White House Fellow, or equivalent {Merged into “OLM” above}*
- Yes US - Officer served in exchange with USN, USMC, USA, Coast Guard in any capacity, however if in PME course, it must be a “long” course like ACSC or War College; Do not count PME until 1968 since too many GOs prior to this date attended Army PME because they were in still in the *Army Air Corps/Forces*
- No – No exchange tours. Joint tours, duty with NATO etc., do not count as exchange tours
- Gender: [male, female]
  - male - when photo indicates, or “he” is used to describe GO in biography
  - female – when photo indicates or “she” is used to describe GO in biography
- Apparent Race: [White, NW, unknown]
  - White - Appear “white” in photo
  - NW - Appear “nonwhite” in photo
  - unknown - photo not provided or unclear
- Lt Col & Below C4ISR: [Air Defense, FAC, CAOC, SIOP, ABM, Intel, Missile Ops, Space Ops, Comm/Electronics, No] Credit first tour chronologically in C4ISR at rank of 2<sup>nd</sup> lieutenant through lieutenant colonel. Intent is to capture tours in operations, maintenance and staff, but not in acquisitions.
  - Air Defense – Tour as an ABM, or any non-Acquisitions position on staff or in command with North American Aerospace Defense (NORAD) Command, or an Air Defense Region. Also count air defense related C4ISR staff positions that are not clearly acquisitions. Flying as an interceptor pilot or command of a fighter intercept squadron does not count.
  - FAC – Forward Air Controller. Credit tours as airborne, ground, or fast FACs; Air Liaison Officer tours with ground units; ground/surface unit liaison tours; and command over FAC or close air support units.
  - CAOC – Combined Air Operations Center. Tour as commander or staff in any tactically oriented air operations center. Examples include Tactical Air Control Center (TACC), Tanker/Airlift Control Center, Airlift Control Center, CAOC, etc. Also count pilots and navigators of AWACS or JSTARS units; and tactical type C4ISR staff positions that are not clearly in acquisitions.
  - SIOP – Single Integrated Operations Plan. Tours mentioning staff work with the SIOP or Joint Strategic Target Planning Staff.
  - ABM – Air Battle Manager. Tour as ABM, weapons controller, weapons director, intercept controller, surveillance officer, or in an air control squadron, etc.

- Intel – Tour as intelligence officer or in an intelligence unit. Serving in an *operations and intelligence* staff division does not count. Flying as a reconnaissance pilot or command of a reconnaissance squadron does not count.
- Missile Ops – Tour in missile operations, missile maintenance, or missile staff position that is not clearly acquisitions.
- Space Ops – Tour in space operations, maintenance or staff position that is not clearly acquisitions.
- Comm/Electronics – Tour in communications, electronics, communications, or command and control systems in operations, maintenance or staff positions that are not clearly acquisitions.
- No – No C4ISR tours between ranks of 2<sup>nd</sup> lieutenant and colonel in biography
- Colonel C4ISR: [Air Defense, FAC, CAOC, SIOP, ABM, Intel, Missile Ops, Space Ops, Comm/Electronics, No] Credit first tour chronologically in C4ISR at rank of colonel. Intent is to capture tours in operations, maintenance and staff, but not in acquisitions.
  - Air Defense – Tour as an ABM, or any non-Acquisitions position on staff or in command with North American Aerospace Defense (NORAD) Command, or an Air Defense Region. Also count air defense related C4ISR staff positions that are not clearly acquisitions. Flying as an interceptor pilot or command of a fighter intercept squadron does not count.
  - FAC – Forward Air Controller. Credit tours as airborne, ground, or fast FACs; Air Liaison Officer tours with ground units; ground/surface unit liaison tours; and command over FAC or close air support units.
  - CAOC – Combined Air Operations Center. Tour as commander or staff in any tactically oriented air operations center. Examples include Tactical Air Control Center (TACC), Tanker/Airlift Control Center, Airlift Control Center, CAOC, etc. Also count pilots and navigators of AWACS or JSTARS units; and tactical type C4ISR staff positions that are not clearly in acquisitions.
  - SIOP – Single Integrated Operations Plan. Tours mentioning staff work with the SIOP or Joint Strategic Target Planning Staff.
  - ABM – Air Battle Manager. Tour as ABM, weapons controller, weapons director, intercept controller, surveillance officer, or in an air control squadron, etc.
  - Intel – Tour as intelligence officer or in an intelligence unit. Serving in an *operations and intelligence* staff division does not count. Flying as a reconnaissance pilot or command of a reconnaissance squadron does not count.
  - Missile Ops – Tour in missile operations, missile maintenance, or missile staff position that is not clearly acquisitions.
  - Space Ops – Tour in space operations, maintenance or staff position that is not clearly acquisitions.



- Comm/Electronics – Tour in communications, electronics, communications, or command and control systems in operations, maintenance or staff positions that are not clearly acquisitions.
- No – No C4ISR tours as a colonel mentioned in biography
- GO C4ISR: [Air Defense, FAC, CAOC, SIOP, ABM, Intel, Missile Ops, Space Ops, Comm/Electronics, No] Credit first tour chronologically in C4ISR at rank of general officer (GO). Intent is to capture tours in operations, maintenance and staff, but not in acquisitions.
  - Air Defense – Tour as an ABM, or any non-Acquisitions position on staff or in command with North American Aerospace Defense (NORAD) Command, or an Air Defense Region. Also count air defense related C4ISR staff positions that are not clearly acquisitions. Flying as an interceptor pilot or command of a fighter intercept squadron does not count.
  - FAC – Forward Air Controller. Credit tours as airborne, ground, or fast FACs; Air Liaison Officer tours with ground units; ground/surface unit liaison tours; and command over FAC or close air support units.
  - CAOC – Combined Air Operations Center. Tour as commander or staff in any tactically oriented air operations center. Examples include Tactical Air Control Center (TACC), Tanker/Airlift Control Center, Airlift Control Center, CAOC, etc. Also count pilots and navigators of AWACS or JSTARS units; and tactical type C4ISR staff positions that are not clearly in acquisitions.
  - SIOP – Single Integrated Operations Plan. Tours mentioning staff work with the SIOP or Joint Strategic Target Planning Staff.
  - ABM – Air Battle Manager. Tour as ABM, weapons controller, weapons director, intercept controller, surveillance officer, or in an air control squadron, etc.
  - Intel – Tour as intelligence officer or in an intelligence unit. Serving in an *operations and intelligence* staff division does not count. Flying as a reconnaissance pilot or command of a reconnaissance squadron does not count.
  - Missile Ops – Tour in missile operations, missile maintenance, or missile staff position that is not clearly acquisitions.
  - Space Ops – Tour in space operations, maintenance or staff position that is not clearly acquisitions.
  - Comm/Electronics – Tour in communications, electronics, communications, or command and control systems in operations, maintenance or staff positions that are not clearly acquisitions.
  - No – No C4ISR tours as a general officer mentioned in biography
- Legislative Liaison: [LL, No] Intent is to capture officers who worked issues directly with congress in the ranks of 2<sup>nd</sup> lieutenant through colonel.

- LL – Legislative Liaison. Officer has worked at least one tour in a legislative liaison office or position, or mentions working directly with congress on issues.
- No – No legislative liaison positions or work mentioned in biography



## **Appendix B – Glossary**

AAA – Anti-Aircraft Artillery

ABCCC – Airborne Battlefield Command and Control Center (Module carried in modified C-130 aircraft)

ACC – Air Combat Command

AFSC – Air Force Specialty Code (Occupational specialty code)

ABM – Air Battle Manager

ADC – Air Defense Command or Aerospace Defense Command

AF – Air Force

ALCM – Air-Launched Cruise Missile.

AMRAAM –Advanced Medium-Range Air-to-Air Missile.

ASOC – Air Support Operations Center

ASTRA – Air Staff Training (Program)

ATACMS – Army Tactical Missile System

AWACS –Airborne Warning and Control System (E-3 aircraft)

C4ISR –Command, Control, Communications, Computers, Intelligence, Surveillance, and Reconnaissance

CAOC – Combined Air Operations Center

CEP—Circle Error Probable. The radius of a circle in which 50% of the fired/dropped ordnance can be expected to fall.

CRC – Control and Reporting Center

CRP – Control and Reporting Post

DEW Line – Distant Early Warning Line

FAC – Forward Air Controller. In the Air Force, it typically refers to an officer, usually a pilot, who acts as a man on the scene coordinator between Army or Marine units on the ground and aircraft providing close air support for the ground troops. The FAC may be on the ground or airborne, and he specifically directs the supporting aircraft as they attack the targets he assigns them. However, there are also enlisted positions that perform the same work or do some of the work under a ground FACs' supervision. For example, in the Air Force there are enlisted terminal attack controllers, enlisted special operations combat controllers, radio operator maintainer and driver (ROMAD), air liaison officers, forward aircraft controllers (airborne) forward aircraft controllers (ground), tactical air control party members, and air support operations squadrons. In addition to the Air Force mix, the other military services have a similar mix of enlisted and officer positions, which frequently also include the mission of requesting and controlling artillery support. Consequently, I often use "FAC" in the broader sense of all these positions that directly assign targets, mark targets with lasers, and control aircraft performing close air support.

FY – Fiscal Year

GCI – Ground-Controlled Intercept

GLCM – Ground-Launched Cruise Missile

GO – General Officer (Officer holding the rank of brigadier general (one-star), major general (two-star), lieutenant general (three-star), general (four-star), or general of the Air Force (five-star, in time of war only).

GPS – Global Positioning System

HARM – High-speed Anti-Radiation (radar) Missile

ICBM – Intercontinental Ballistic Missile

IFF – Identification, Friend or Foe

INS – Inertial Navigational System

ISS – Intermediate Service School



JDAM – Joint Direct Attack Munition. Family of Inertial Navigational System (INS) or Global Positioning System (GPS) guided munitions.

JFACC – Joint Forces Air Component Commander

JOC – Joint Operations Center

JSTARS – Joint Surveillance Target Attack Radar System (E-8 aircraft)

JTIDS – Joint Tactical Information Distribution System

MATS – Military Air Transport Service

MRBM – Medium-Range Ballistic Missile

NATO – North Atlantic Treaty Organization

Nav – Navigator

NEACP – National Emergency Airborne Command Post

NORAD – North American Aerospace Defense Command

PGM – Precision-Guided Missile

PME – Professional Military Education

RAF – Royal Air Force

RIF – Reduction in Force

SAC – Strategic Air Command

SAGE – Semi-Active Ground Environment (command and control) system

SAM – Surface-to-Air-Missile

SIOP – Single Integrated Operation Plan

SLBM – Submarine-Launched Ballistic Missile

SSS – Senior Service School

TAC – Tactical Air Command

TACC – Tactical Air Control Center

TADC – Tactical Air Direction Center

TLAM – Navy Tomahawk Land Attack Missile

UAV – Unmanned Aerial Vehicles.

UCAV – Unmanned Combat Aerial Vehicle

USAF – United States Air Force

USAFSD – United States Air Force Statistical Digest

WC – Weapons Controller

WD – Weapons Director



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